

**VISUAL IMPACT ASSESSMENT FOR THE PROPOSED BLANCO
– GOURIKWA 400kV TRANSMISSION LINE – EIA PHASE**

PREPARED BY:

I-Dot Design Studio CC trading as *i-scape*
Reg. no: 2010/034929/23

P.O.Box 14956
Zuurfontein
1912

Fax: 086 520 4677
Tel: 076 169 1435

Email: i-scape@vodamail.co.za



PREPARED FOR:

Envirolution Consulting (Pty) Ltd

Columbine Ave 223
Mondeor
2019

Fax: 0861 626 222
Tel: 0861 444 499

Web: www.envirolution.co.za



EXECUTIVE SUMMARY

I-scape, an independent consultant, has been appointed by Envirolution Consulting (Pty) Ltd to provide a report for the Environmental Impact Assessment (EIA) of the proposed Blanco - Gourikwa 400kV transmission line, on the issues pertaining to visual impacts. The client, ESKOM SOC, has proposed the construction of a 400kV transmission line in the Western Cape Province between the Blanco Substation (approximately 6.5 km west of George) and the existing Gourikwa Substation (approximately 15 km west of Mossel Bay).

A Visual Impact Assessment (VIA) assesses the potential visual changes/impacts to an existing baseline environment resulting from the implementation of a proposed project. The associated visual changes could potentially have an impact on the character and value of the landscape and affect the views and perceptions of observers in the study area. The purpose of the study is to determine the significance of the changes/impacts and to recommend mitigation measures where the impacts are considered unacceptably negative. This VIA forms part of the Scoping and EIA study as required by the National Environmental Management Act (NEMA) and the EIA Regulations (2014).

PROJECT DESCRIPTION

The proposed project joins the existing Gourikwa Substation to the future Blanco Substation with a 400kV transmission line. The distance between the substation sites is approximately 60 km. Three alternative alignments are proposed within a corridor of 2 km.

- Alternative 1: This corridor exits Gourikwa Substation in a north easterly direction and follows the R327 for approximately 8 km. It turns east and cuts across a rural landscape, passing through the most eastern part of the Gondwana Private Game Reserve. It maintains a north eastern direction, nearing the mountainous terrain of the Outeniqua Mountains, until reaching the Blanco Substation. The Blanco Substation is approximately 6 km west of the George.
- Alternative 2: This corridor starts in the same direction as Alternative 1 but turns east just south of the Gondwana Private Game Reserve. It follows an easterly direction, crossing the Hartebeeskuil Dam before turning north-east as it reaches the R328 between Hartenbos and Brandwacht. It passes south of Botlieskop Private Game Reserve and crosses Wolwedans Dam before turning north and reaching the Blanco Substation.
- Alternative 3: This corridor is a variation of Alternative 2 and exits the Gourikwa Substation in an easterly direction. It brushes past the western outskirts of Hartenbos before turning north and joining Alternative 2.

The proposed project traverses numerous properties and municipalities, and influences both the Western Cape and Eastern Cape provinces. Considering the length of the proposed power line and the size of the individual transmission towers, it can be concluded that the project requires assessment on a larger regional scale.

LANDSCAPE CHARACTER ASSESSMENT

The study area can be described as the area affected by visual impact. It has been defined as a zone of up to 5 km from the outer edge of the proposed corridor, or to the limit of the project's visibility, whichever is smallest. This is referred to as the Zone of Visual Influence (ZVI). The factors that most significantly influence the ZVI are topographic variation and land use or land cover, which could

potentially expose or screen the proposed project from sensitive viewpoints. These factors also contribute to the character of the study area.

In order to follow a versatile and pragmatic approach, the study area is divided into two different Landscape Types (LTs), namely:

- **Coastal Towns:**

- This LT is limited to the coastal region and forms a very small part of the study area. The most densely populated areas are along the coastline, with the Town of George located further inland. What use to be placid holiday towns, have developed into established communities. A peaceful atmosphere prevails but changes to a vibrant holiday atmosphere when thousands of tourists gather over holiday seasons. The towns developed rapidly along the coast and have been forced inland to accommodate the influx of permanent residents and holidaymakers. The predominant land use is residential, with commercial and light industrial development along the N2 highway. Due to the high tourism potential, many holiday resorts and privately owned guest houses are located in the towns, mostly close to the beaches. Further extensions are planned north of Hartenbos as part of the existing Monte Christo Estate and it can be expected that more outlying areas will be developed in future. George is considered outside of the study area with the western part of Blanco situated on the perimeter of the study area. This LT will not be affected by Alternative 1 and 2, but Alternative 3 brushes past the western and northern outskirts of Hartenbos.

- **Inland Rural Landscape:**

- The largest part of the study area consists of the Inland Rural LT and occupy the area between the coastline and the Outeniqua Mountains. It is a landscape with diversity but its rural character and similar agricultural practices create a uniformity over the entire area. For discussion purposes, the Inland Rural LT is subdivided into a western, central and eastern region. The eastern region is intensely farmed and very little of the natural vegetation occur. It is greatly transformed by cultivated fields with natural and semi-natural systems limited to the valleys of large rivers. The central region consists of a reasonable percentage of cultivation, but due to the varied topography, natural ecosystems are more readily found. Botlierskop Game Reserve conserves approximately 3500ha of natural and semi-natural ecosystems. In the western part of the study area, Gondwana Game Reserve and Hartenbos Game Lodge conserve 4000ha and 860ha respectively. These areas are considered natural, although fragmented cultivation occur between the reserves. Nearer to Gourikwa Substation, the topography levels out and cultivation occur at large scale.
- This area is part of the Garden Route and is wedged between the scenic Outeniqua Mountain Range and the very popular coastal towns. The regional tourism industry has developed to not only offer activities along the coastline, but also managed to add major tourist attractions in the interior in the form of luxury accommodation, game farms and other outdoor activities. POI are more concentrated in the western and central regions where most of the game farms are located. Other outdoor activities are presented such as skydiving, horse riding trails, hiking, etc. Large dams namely, Hartebeeskuil-, Klipheuwel- and Wolwedans Dam, offer fishing and birding opportunities while enjoying the rural character. In the eastern region POI are limited to a couple of guest houses nearer to Blanco. This area is mostly farms but still offer scenic views towards the Outeniqua Mountains to the north.

A LT is a unit in the study area that is similar in its landscape character and aesthetic value. The features can be grouped together as it will react similar to impacts imposed on it.

IMPACT ASSESSMENT

A VIA is a specialist study that assesses the potential visual changes/impacts to an existing baseline setting resulting from the implementation of a proposed project. This implies that, firstly, a baseline must be established and secondly, the visual change, resulting from the project, must be compared to the baseline. The quantification of the visual change is referred to as the severity of the impact and is a function of:

- The nature of the impact;

- The probability of the impact occurring;
- The duration of the impact;
- The extent of the impact; and
- The magnitude of the impact.

The essence of determining the significance of a visual impact centres on the severity of the potential impacts, and the sensitivity of the affected receptors. In simple terms, a low severity impact affecting receptors of low sensitivity will result in a low significance. On the other end of the scale, a highly severe impact, affecting highly sensitive receptors, will result in a high significance.

Within the study area observers experience and interact differently with their environment, and therefore value it differently. They may be affected by the proposed project due to additions or alterations in the visual environment which may influence their experience and views of the visual resource. In this study a distinction is made between impacts on the **observers** and impacts on the **visual resource**. The observers represent all people that may be affected visually, while the impacts on the visual resource strictly assess the changes to the landscape character and the impact on its visual value.

OBSERVER SENSITIVITY

Often, the general acceptance or non-acceptance of a project will be reflected in Public Participation events and is considered a valuable indicator of the true viewer sensitivity. The proposed transmission line has received a great deal of criticism, particularly from residents and tourism operators in the study area. The criticism is motivated by negative sentiments due to historical encounters with the applicant, but also issues revolving around health, safety, loss in property value, interference with current land use practices, ecological impacts, etc. The comments that are relevant to this study are specific to issues that causes visual intrusion on observers' views, and the loss in scenic quality of the visual resource.

A brief summary of concerns that were received during the input sessions with I&APs is provided below:

- The transmission line will negatively impact on photographic potential of the landscape;
- The transmission line will spoil the natural environment and therefore decrease the scenic quality of the visual resource;
- The construction process will cause unsightly disturbances that could lead to eyesores due to a lack of proper mitigation;
- Land values may decrease due to visual impact from transmission lines. This is interpreted as an issue relating to the decrease in aesthetic value, as many properties are developed in such a way as to take advantage of scenic views;
- Poor maintenance and aftercare of the servitude that results in eyesores; and
- Negative impact on eco-tourism. This relates to an issue of aesthetic value where tourism activities centres around the scenic quality of the environment.

The main observer groups in the study area are residents, tourists and motorists. The categorisation implies that the observers in that particular category will experience and appreciate the visual resource in a fairly similar fashion and will therefore have a similar sensitivity.

Residents are considered visual receptors of a high sensitivity. They have an attentive awareness towards their living environment and have a sustained exposure to a particular impact.

Tourists are also considered visual receptors of a high sensitivity. Their purpose of visiting an area is to enjoy the scenic environment and they have a high expectation of the aesthetic value provided by the visual resource.

Motorists normally have a low sensitivity as their attention is generally focussed on the road, and their exposure to roadside objects is brief due to the speed they travel.

LANDSCAPE CHARACTER SENSITIVITY

The sensitivity of a landscape's character is a measure of the robustness of its character and the ability of the landscape to accommodate certain changes without detrimental impacts to its qualities.

- **COASTAL TOWNS:**

- The only alternative that will cause a significant impact on this LT is Alternative 3 where its corridor intersects with the western regions of Hartenbos. Should the transmission line follow this route it will not affect the existing settlement patterns, but future development will have to allow for a safe 55m wide servitude which will impact on settlement patterns. The Coastal Towns LT is considered a landscape with **medium** sensitivity along its western outskirts. It is considered a transition zone between the urban and rural landscape.

- **INLAND RURAL LANDSCAPES:**

- The Inland Rural LT is considered **moderate** to **highly** sensitive. The highly sensitive regions are in the western and central regions where a concentration of visual amenities are present. The eastern region is moderately sensitive due to its intensely farmed land use, but individual features are considered highly sensitive.

IMPACT ASSESSMENT SUMMARY

Landscape Type	Project Alternative	Sensitivity of receptors	Severity of Impact without mitigation	Severity of Impact with mitigation	Significance of Impact without mitigation	Significance of Impact with mitigation
Coastal towns	Construction phase					
	Alt 3	OB: High	Medium	Low	Moderate	Moderate/Minor
		VR: Medium	Medium	Low	Moderate/Minor	Minor
	Operational phase					
	Alt 3	OB: High	High	High	Major	Major
		VR: Medium	High	High	Moderate	Moderate
Inland Rural Landscapes	Construction phase					
	Alt 1	OB: High	Medium	Low	Moderate	Moderate/Minor
		VR: High	Medium	Medium	Moderate	Moderate
	Alt 2	OB: High	Medium	Low	Moderate	Moderate/Minor
		VR: High	Medium	Medium	Moderate	Moderate
	Alt 3	OB: High	Medium	Low	Moderate	Moderate/Minor
		VR: High	Medium	Medium	Moderate	Moderate
	Operational phase					
	Alt 1	OB: High	High	High	Major	Major
		VR: High	High	High	Major	Major
	Alt 2	OB: High	High	High	Major	Major
		VR: High	High	High	Major	Major
	Alt 3	OB: High	High	High	Major	Major
		VR: High	High	High	Major	Major

SUMMARY OF FINDINGS

This VIA assessed the potential visual changes that may occur as a result of the construction and operation of a new 400kV transmission line between the Gourikwa- and Blanco Substations. Three alternative routes have been proposed that extend over a 60 km distance. All three routes traverse areas that are considered highly scenic, as a result of the presence of open water bodies, natural and semi-natural landscapes and the ever present backdrop of the Outeniqua Mountain Range.

In most cases, the transmission line will impact on the aesthetic value of the visual resource by interfering with the prevailing natural and semi-natural character of the study area, or interfering with the agricultural land uses. Areas or features of high aesthetic value and scenic quality has been identified as:

- All the game reserves in the western and central regions that are valued for their natural character, conservation of the indigenous vegetation and scenic landscapes;
- All the large dams and rivers that are crossed by the proposed routes that are valued for its aesthetic value and eco-tourism potential;
- The undulating and varied landscape of the western and central regions that is a cause for picturesque views towards the ocean and towards the Outeniqua Mountain Range.

The study area is predominantly rural with an extended farming community, with the exception of the coastal towns in the southern region and George on the eastern perimeter. Numerous tourist attractions are present in the western and central regions in the form of game reserves, offering luxury accommodation, and other outdoor activity areas such as hiking and horse riding. These tourist facilities rely on the scenic quality of the region and game drives are sometimes offered to experience the picturesque outdoors.

Overall a medium viewer incidence is expected apart from the areas where major transport routes are crossed or near the coastal towns. Highly sensitive viewers and viewer groups occur all along the proposed routes. Concentrations of highly sensitive viewers and major tourist attractions have been identified at:

- Gondwana-, Hartenbos- and Botlierskop Game Reserve;
- Hartebeeskuil-, Klipheuwel- and Wolwedans Dams;
- Western outskirts of Hartenbos, Monte Christo Estate and Wolwedans; and
- All the tourist attractions and overnight facilities that are within the ZMVE;

Reduction and remediation mitigation will not be effective to prevent residual impacts from occurring. The proposed transmission line will remain visible unless major design or alignment changes are implemented. The option of consolidating existing lines into the design of the new transmission line is regarded as very effective and is highly recommended to prevent major cumulative impacts. Although cumulative impacts may still occur, the significance thereof will be reduced and the exceedance of a visual intolerance threshold may be avoided.

Avoiding sensitive landscape features and observers is regarded as being the most effective mitigation measure in reducing direct, cumulative and residual impacts. This is, however, a complex measure to implement, and is reliant on technical/feasibility studies as well as a much larger study area assessment to ensure that other sensitive features and observers are not impacted. Due to

these unknown factors, avoidance mitigation is only proposed within the 2 km corridor that will reduce visual impacts on certain receptors.

PREFERRED ROUTE

Although all three routes have high impacts on both observers and the visual resource, Alternative 1 is the most preferred route. The motivation is that the baseline environment is already impacted by the Proteus – Droërvier 400kV transmission line which lowers the sensitivity of the visual environment to some degree. One can argue that the project is more compatible with the baseline environment along Alternative 1, than the other two alternative routes. It is generally more acceptable to have two power lines of the same design, in one corridor, thereby concentrating the impact in that corridor, than to spread the impact over a larger area, thereby impacting on other landscapes that are free of transmission lines. Empirical research has indicated that two parallel running power lines are considered below the visual tolerance threshold in most cases, but three or more power lines nears, or exceeds, the threshold, increasing cumulative impacts to unacceptable levels. This is especially relevant in landscapes with high scenic value or high tourist potential as is found in parts of the study area.

In addition, Alternative 1 is the route that impacts on the least number of sensitive landscape features and steers clear of the least number of tourist attractions. Without drastic mitigation measures, the impact on the visual resource and sensitive observers will remain high.

Alternative 2 is more preferred than Alternative 3. Alternative 3 passes within 1 km of an urban area and the increased viewer incidence makes it less preferable than Alternative 2. Both these alternatives will have significant cumulative impacts due to the existing 2x132kV distribution lines in the same corridor. A significant increase in visual dominance of electrical infrastructure can be expected. Three power lines in one corridor are expected to exceed the visual tolerance threshold. The factor that adds weight to this statement is that each line will consist of a different type of tower that causes major visual incoherence and clutter.

The No-Go alternative will have no change to the visual environment and will therefore not cause any impacts.

CONCLUSION

This assessment highlights that highly significant impacts are expected in the study area and require major interventions to reduce the direct and cumulative impacts in particular. Authorisation of this project will result in significant losses in aesthetic value that will cause high levels of visual intrusion in some areas. The impact is only reversible with human intervention and stand a moderate risk of causing an irreplaceable loss in resources.

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LIST OF ABBREVIATIONS

AH	Agricultural Holdings
EIA	Environmental Impact Assessment
DEM	Digital Elevation Model
GIS	Geographical Information System
I&AP	Interested and Affected Party
LCA	Landscape Character Assessment
LT	Landscape Type
OB	Observer
POI	Points of Interest
SOC	State Owned Company
VAC	Visual Absorption Capacity
VIA	Visual Impact Assessment
VR	Visual Resource
ZMVE	Zone of Maximum Visual Exposure
ZVI	Zone of Visual Influence

1 INTRODUCTION

I-scape, an independent consultant, has been appointed by Envirolution Consulting (Pty) Ltd to provide a report for the Environmental Impact Assessment (EIA) of the proposed Blanco - Gourikwa 400kV transmission line, on the issues pertaining to visual impacts. The client, ESKOM SOC, has proposed the construction of a 400kV transmission line in the Western Cape Province between the Blanco Substation (approximately 6.5 km west of George) and the existing Gourikwa Substation (approximately 15 km west of Mossel Bay).

A Visual Impact Assessment (VIA) assesses the potential visual changes/impacts to an existing baseline environment resulting from the implementation of a proposed project. The associated visual changes could potentially have an impact on the character and value of the landscape and affect the views and perceptions of observers in the study area. The purpose of the study is to determine the significance of the changes/impacts and to recommend mitigation measures where the impacts are considered unacceptably negative. This VIA forms part of the Scoping and EIA study as required by the National Environmental Management Act (NEMA) and the EIA Regulations (2014).

The site investigations were done during the months of March and July on two separate occasions. A large part of the study area is predominantly a winter rainfall area and the photographs used in the document represents the character of the landscape during autumn and winter months.

2 LIMITATIONS AND ASSUMPTIONS

This section provides a clear description of the limitations and assumptions that influence the accuracy of the assessment and the confidence of the visual specialist in his professional judgement. The level of confidence is a function of the level of knowledge and information that is available regarding to the study area and the project. The following aspects have been identified as uncertainties, unknowns or limitations:

- A Visual Impact Assessment is not a purely objective science and often integrates qualitative evaluations based on expected human perceptions. It is the visual specialist's intention to utilise as much quantitative data as possible to substantiate professional judgement and to motivate subjective opinions;
- The period of assessment was during the month of July (2015) and a brief visit to selected parts of the study area was done during March (2016). Time and budget constraints does not allow for site investigations across all seasons and investigating the character changes throughout the study area. The visual specialist is confident that this constraint does not affect the accuracy of the assessment;
- During the July site investigation, large parts of the study area received copious amounts of rain and certain regions were inaccessible due to isolated flooding. The inclement weather also made photography difficult and some areas weren't as well documented as others;
- Large parts of the study area consist of privately owned properties and access is often restricted. The photographic record represents views from publicly accessible places;
- The proposed project has not yet reached an advanced technical design phase, and therefore lacks information on exact alignments, construction duration and positioning of construction camps, etc. These unknowns have a negative impact on the accuracy of the

assessment during the construction phase in particular, but assumptions are drawn from experience with other projects of a similar nature.

3 INFORMATION SOURCES

Research is done over a wide platform in order to understand the macro-scale complexities of the study area. The information sources that are typically utilised include, but are not limited to:

- GIS generated maps such as land cover and elevation maps;
- Visibility analyses based on 20 m contours generated by GIS software;
- Google Earth images of the project site;
- Web searches on specific items in or surrounding the study area;
- A site investigation to establish a photographic record;
- Comments made, and/or information provided by I&APs;
- Project specific information provided by Eskom SOC and/or the lead consultant;
- Professional knowledge and experience gained from similar projects.

Section 0 provide a list of specific references that influenced the study approach and methodology.

4 METHODOLOGY STATEMENT

4.1 INTRODUCTION

According to a study by the Transportation Research Board of the National Academies (2013), criteria of ten points can be implemented to evaluate a VIA methodology. The ten points that define a good standard of reporting are described as being:

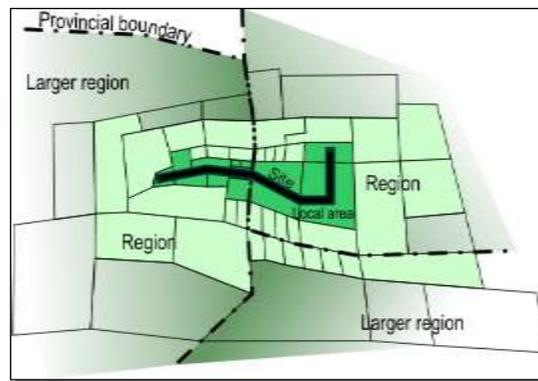
1. Objective – the procedure should be designed to eliminate individual bias;
2. Valid – the procedure should be defensible and legitimate within a legal framework;
3. Reliable – adequately trained professionals following the same procedure should reach similar results;
4. Precise – the data required by the procedure should be measured at a grain or scale sufficiently fine to validly measure or describe characteristics of substantive interest and sufficiently coarse to be pragmatically implemented;
5. Versatile – the procedure supports valid assessments of different types of proposed changes from the perspectives of different viewer groups interacting with different landscape settings;
6. Pragmatic – the procedure can be easily and efficiently implemented by a trained professional;
7. Easily understood – the procedure and assessments are accessible to the public and decision makers;
8. Useful – the procedure and assessments affect location, design or mitigation decisions.
9. Consistently implemented – the procedure can be applied consistently among different projects and individual assessments are consistent with the chosen procedure;
10. Legitimate – the procedure is supported by laws, regulations or other legal mechanisms, uses socially/culturally accepted standards as well as scientifically accepted standards.

These ten points are considered international benchmarks in the compilation of a Visual Impact Assessment and will dictate the VIA methodology and assessment strategy for this project.

4.2 DEFINING A SCALE AND LEVEL OF ASSESSMENT

The size of the study area and the extent of the project impact will determine the scale and level of assessment. The study area can be described as the area affected by visual impact. The study area can be defined by four assessment levels namely:

- **Site** is the smallest level of assessment and stipulates the extent of the activities related to the project. This is limited to the footprint of the project or the area of disturbance;
- The **local area** is limited to the immediate surroundings and will often be defined by the properties on which the project is located and could possibly include the surrounding properties;
- A **region** is described by area classifications such as cities/towns and municipalities/districts; and
- A **larger region** will be measured by provincial, national or international borders being crossed or affected.



A study by Hull & Bishop (1988) concluded that a power line has its maximum impact on the visual environment when viewed from distances \leq than 1 km. Beyond this distance, the impact decreases considerably to a point where it is virtually insignificant. This should not be confused with the visibility of a power line. It is possible to visually detect a power line over much greater distances, but Hull & Bishop specifically assessed the impact of a power line on the visual environment. A zone of maximum visual impact is therefore delineated around the project area at 1 km, but a larger zone of up to 5 km is assessed to verify Hull & Bishop's findings.

The proposed project traverses numerous properties and municipalities, and influences both the Western Cape and Eastern Cape provinces. Three alternative alignments are proposed with lengths of approximately 60 km. Considering the length of the proposed power line and the size of the individual transmission towers, it can be concluded that the project requires assessment on a larger regional scale.

Point 4 in Section 4.1 refers to the level of detail that is appropriate to the scale of the assessment. The project is considered a large scale project due to its linear length and influences a study area on a larger regional scale. The level of detail deemed appropriate to the scale of the assessment is on a regional scale and translates into the identification of landscape types and viewer groups that will be similar in characteristics and experiences respectively. In certain cases, specific landscape features or viewers will be highlighted to address particular impacts at that location.

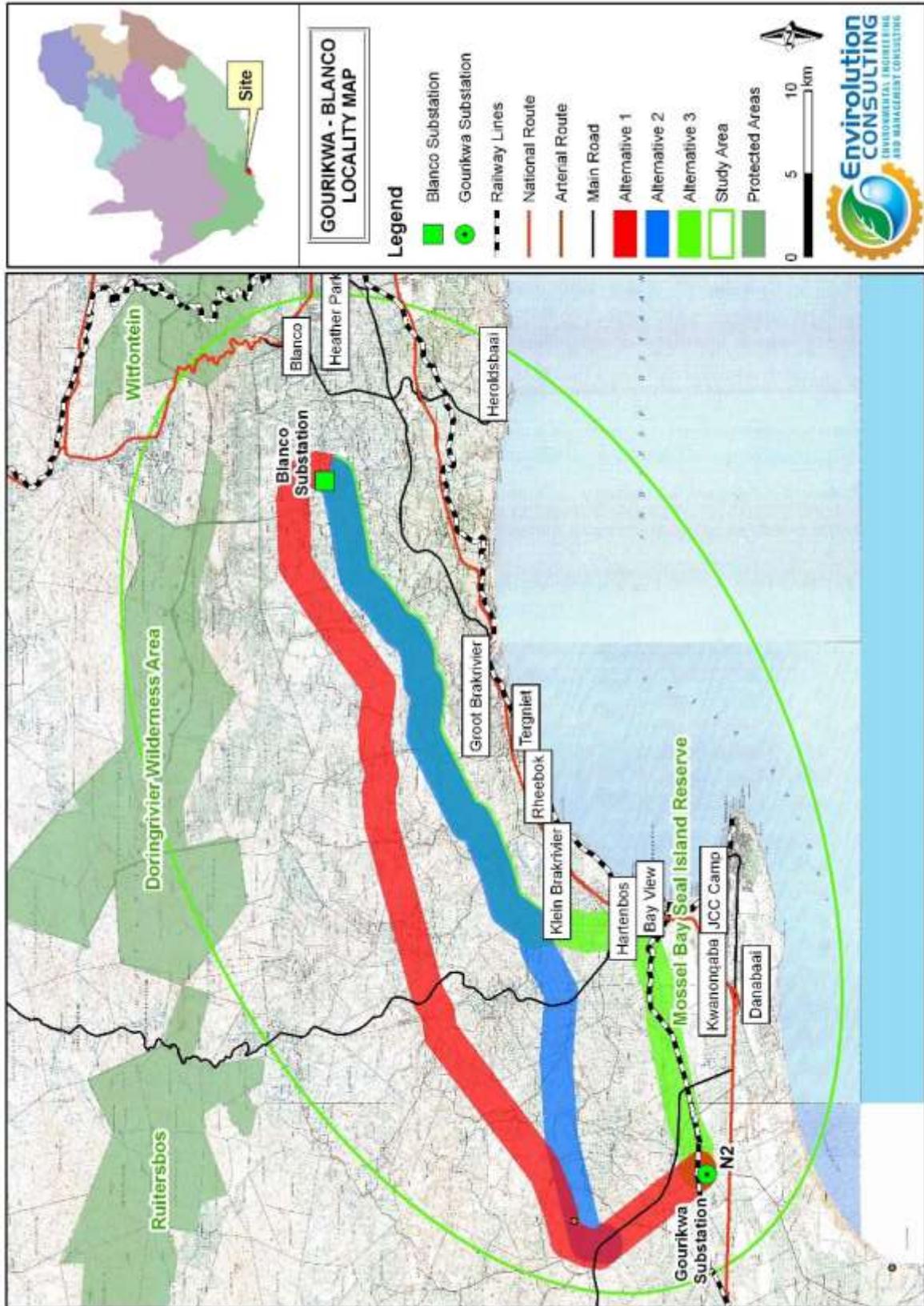


Figure 1: Locality Map

4.3 VIA OBJECTIVES

The objectives of this study will be to:

- Establish a methodology that abides to the criteria in section 4.1 as well as to the NEMA regulations;
- Address the concerns from Interested and Affected Parties (I&APs) that are raised during the EIA process which relates to aesthetic or visual aspects;
- Determine the significance of the impacts on the observers in the study area and the landscape character due to the change in the visual characteristics of the environment;
- Recommend mitigation measures to alleviate or reduce the anticipated impacts; and
- Arrive at a preferred alternative as determined by the findings of this study.

4.4 VIA METHODOLOGY

The above objectives will be met through the implementation of the following methodology:

- 1) **Site investigation:** Identify sensitive viewpoints and capture the character of the visual environment by establishing a photographic record;
- 2) **Project description:** Describe the type, scale and visual characteristics of the proposed project and its individual elements or phases;
- 3) **Delineate the study area and divide it into logical landscape types:** Determine the extent of the study area and identify landscape types that have similar visual characteristics;
- 4) **Compile a Landscape Character Assessment:** Discuss the tangible and intangible characteristics of the study area to determine its value and sensitivity;
- 5) **Determine the sensitivity of receptors:** Assess the sensitivity of observer groups and landscape types with regards to visual change;
- 6) **Visual Impact Assessment:** Identify and describe the potential direct, indirect, cumulative and residual impacts on both the observer groups and landscape types;
- 7) **Mitigation measures:** Propose mitigation measures to alleviate or completely eliminate the potential impacts that are identified;
- 8) **Rate alternatives:** Provide an argument as to which alternative is most preferred based on the findings of the assessment; and
- 9) **Conclusion and recommendations:** Discuss the project's main issues and provide recommendations where necessary.

5 PROJECT DESCRIPTION

The proposed project joins the existing Gourikwa Substation to the future Blanco Substation with a 400kV transmission line. The distance between the substation sites is approximately 60 km. Three alternative alignments are proposed within a corridor of 2 km, as indicated in Figure 1.

- Alternative 1: This corridor exits Gourikwa Substation in a north easterly direction and follows the R327 for approximately 8 km. It turns east and cuts across a rural landscape, passing through the most eastern part of the Gondwana Private Game Reserve. It maintains a north eastern direction, nearing the mountainous terrain of the Outeniqua Mountains, until reaching the Blanco Substation. The Blanco Substation is approximately 6 km west of the George.

- Alternative 2: This corridor starts in the same direction as Alternative 1 but turns east just south of the Gondwana Private Game Reserve. It follows an easterly direction, crossing the Hartebeeskuil Dam before turning north-east as it reaches the R328 between Hartenbos and Brandwacht. It passes south of Botlieskop Private Game Reserve and crosses Wolwedans Dam before turning north and reaching the Blanco Substation.
- Alternative 3: This corridor is a variation of Alternative 2 and exits the Gourikwa Substation in an easterly direction. It brushes past the western outskirts of Hartenbos before turning north and joining Alternative 2.

The type of towers to be constructed will most probably be steel lattice towers such as those illustrated in Figure 2. The height of such towers may vary depending on the terrain it traverses, but on average, it can be assumed to be 30 to 40 m tall. Additional technical information is provided in Figure 4.

The duration of the construction process is unknown at this stage but it is expected to run in excess of 24 months. This is a relatively large-scale electrical infrastructure development, mainly due to the distance of the project area and the physical size of the towers/pylons that will be constructed.

The following construction procedures are generic stages, normally associated with power line construction, and may vary according to the terrain or type of tower to be assembled:

- Survey and pegging of pole/tower positions through ground and air survey teams;
- Establishment of a construction camp and stockyards;
- Construction of additional access roads and gates if required. Existing roads will be used as far as possible but it can be expected that new roads will typically be established by means of driving over the vegetation continuously and creating a two-tread passage as oppose to a graded gravel road;
- Clearing or trimming of vegetation in the servitude that may interfere with the line;
- Construction of foundations by means of earthmoving equipment such as excavators;
- Tower assembly and erection by means of a ground team and mobile crane. Helicopters may also be used in inaccessible places;
- Conductor stringing and tensioning;
- Servitude rehabilitation;
- Testing and commissioning; and
- Sporadic maintenance.

The physical construction activities are considered low intensity construction. A great percentage of the assembly occurs off site and limited earthworks are required. The location where each tower will be located will be most severely impacted by construction activities such as the operation of earthmoving machinery and delivery trucks. A ground crew will also be present to assist in the construction process. Vegetation will be trampled or removed around the tower base and where new roads are to be constructed, which will expose the underlying soils (refer to Figure 3).

In areas where higher growing vegetation is deemed a safety risk in the servitude, it will be removed or trimmed to the required height. This often results in a corridor devoid of trees and shrubs, and subsequently reduced to grassland or low growing scrub. This is likely to occur in the Klein Karoo

Mountains, and Outeniqua Mountains LTs where trees and certain shrubs grow relatively tall. In some isolated instances, it will may occur in other parts of the study area as well.

Once the power line is completed, the most visible elements will be the towers that are spaced at regular intervals, and the conductors joining the individual towers. A power line is generally considered a weak visual element. The true or actual visibility of an object in the landscape is influenced by a combination of factors. Apart from physical objects that occur in the line-of-sight between the observer and an object, empirical research indicates that the visibility of an object also decreases as the distance between the observer and the object increases. The ability to perceive detail depends on several aspects, of which distance from an object and contrast between the object and its surroundings are considered most influential. The conditions of the atmosphere play a role in the perceivable contrast between an object and its background. Even on the clearest of days, the sky is not entirely transparent and airborne particulates cause a reduction in the vividness of colours. The contrast between light and dark diminishes as the viewing distance increases and the object becomes less and less visible. The object eventually appears to merge with the background, making it imperceptible with the naked eye.

Empirical research suggests that the type of tower (i.e. physical size, intricateness of lattice work and colour), atmospheric conditions, the relative position of the tower in relation to the sun and observer and the distance between the observer and the towers are the main factors influencing true visibility. New towers often have a much shinier appearance than older towers due to the silver, galvanised paint. When light reflects off the new towers it is much more noticeable from greater distances, but weathering reduces the shiny appearance over time. In addition, towers set against a backdrop of muted colours are less visible than those protruding above the skyline with the sky as backdrop. The cross-rope towers are considered the least visible due to their slender and minimalistic appearance, but can only be used on the straight sections of an alignment. The self-supporting towers are bulkier and require thicker steel members to counter sideway forces. These are used on corners.

It has been noted that towers of this scale are fairly visible up to distances of 5 km, but atmospheric conditions and the lack of contrast with the background makes it increasingly difficult to detect at greater distances. This can also be attributed to the slender lattice type construction that is permeable and easily blends in with the background at this distance. Exceptions do exist, but in general, 8 km is considered the furthest a tower is detectable with the naked eye. A new tower is potentially visible from greater distances but its shiny appearance is temporary.

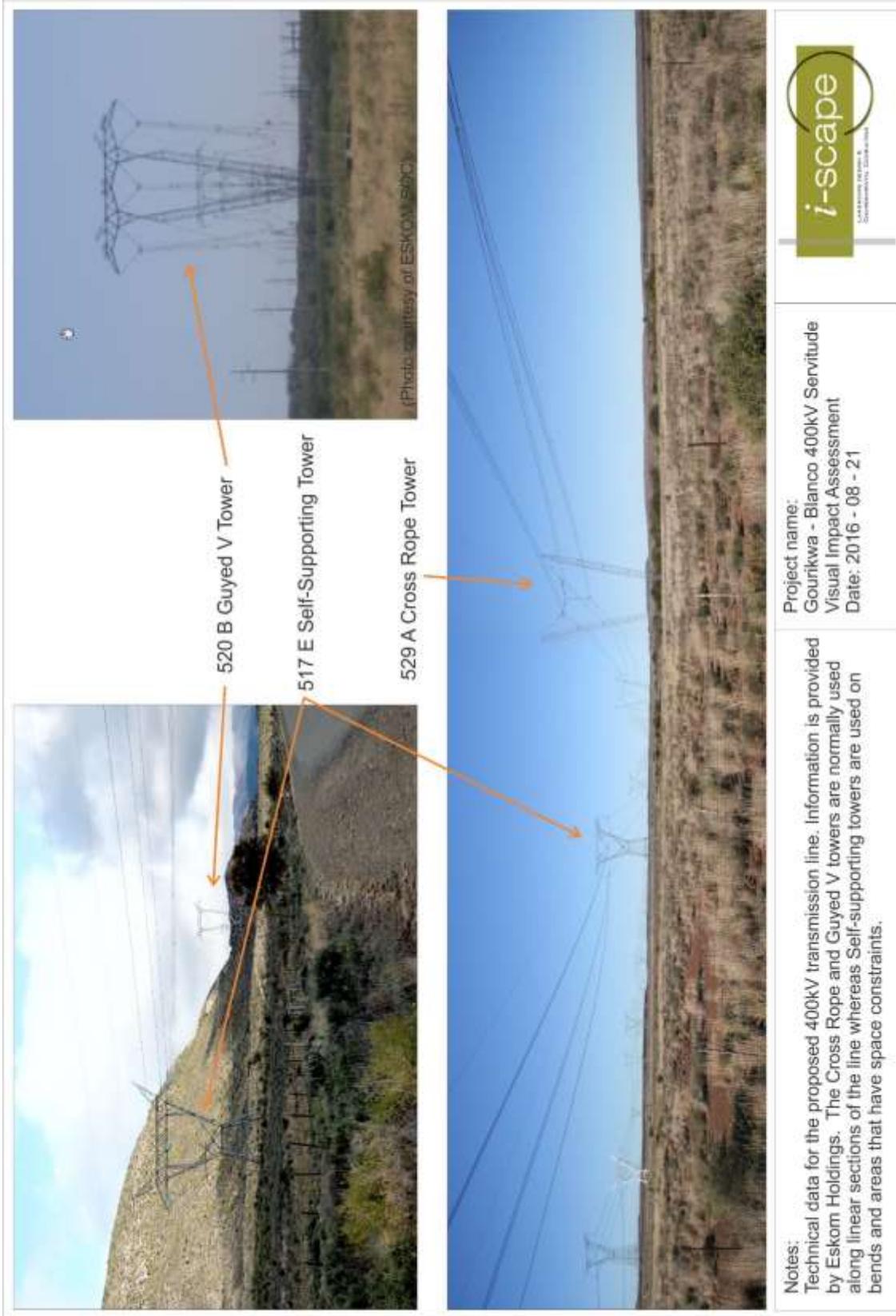


Figure 2: Types of towers being considered

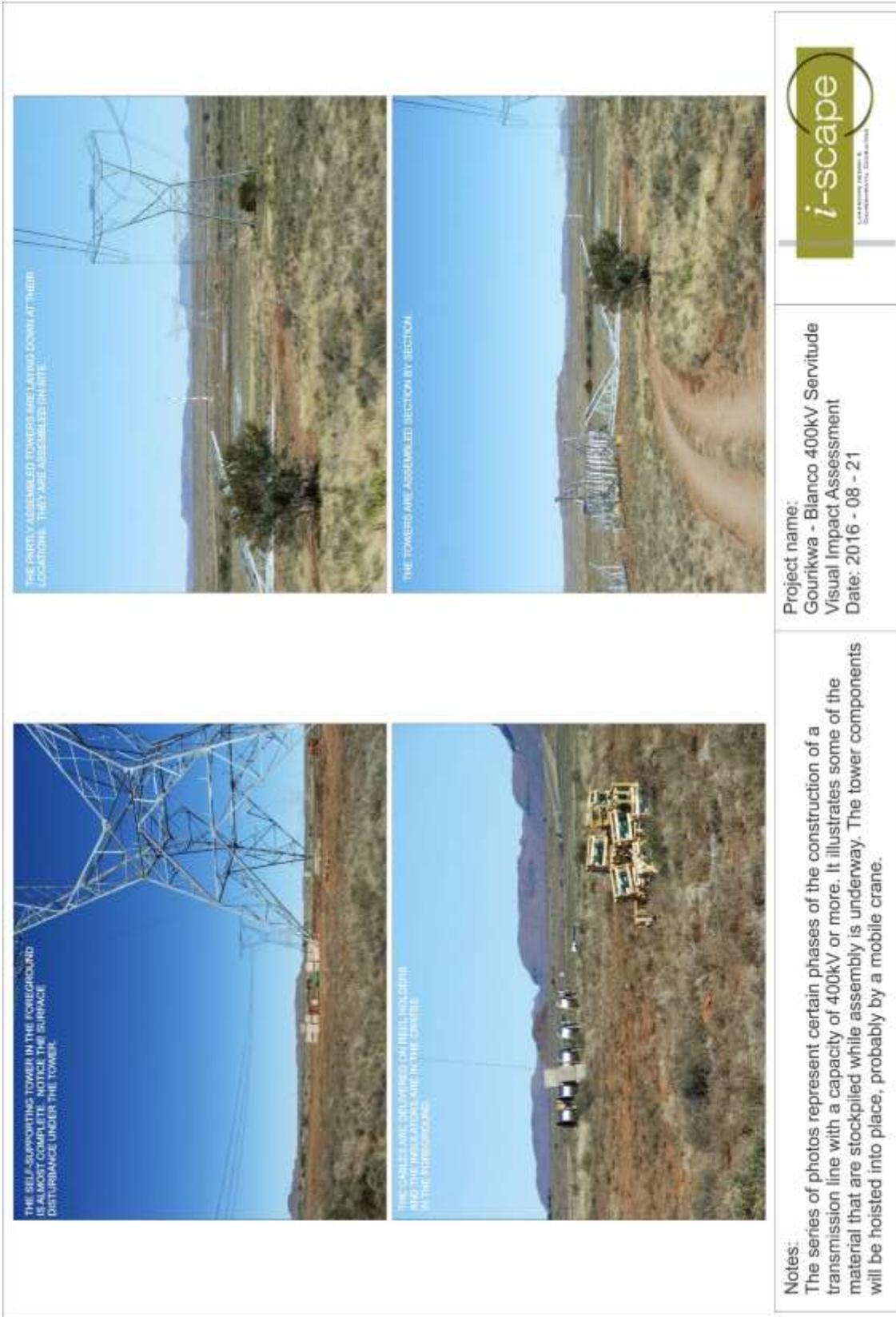
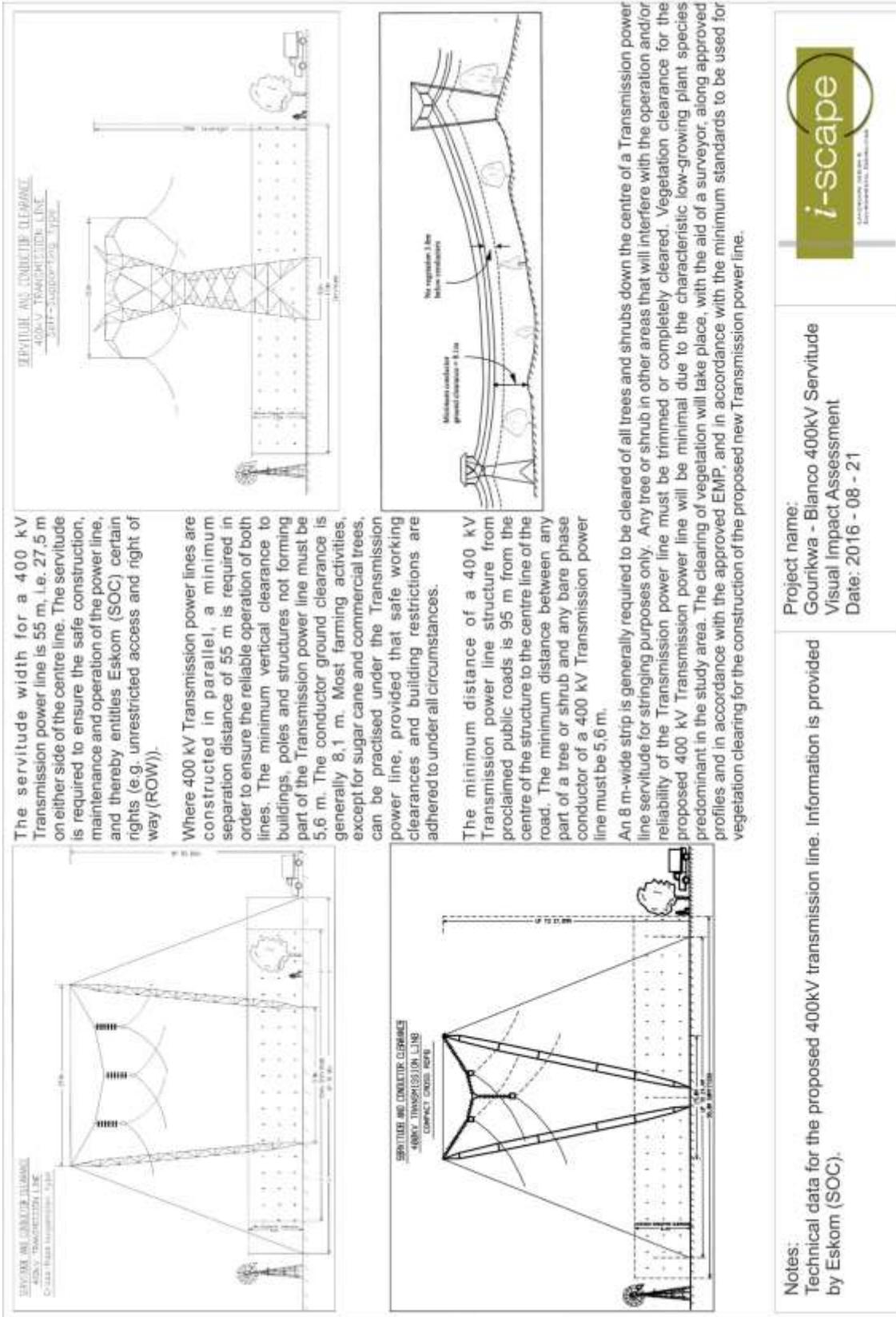


Figure 3: Assembly and construction process



Notes:
Technical data for the proposed 400kV transmission line. Information is provided by Eskom (SOC).

Project name:
Gourikwa - Blanco 400kV Servitude
Visual Impact Assessment
Date: 2016 - 08 - 21



Figure 4: Technical information on transmission lines

6 LANDSCAPE CHARACTER ASSESSMENT

6.1 INTRODUCTION

The study area can be described as the area affected by visual impact. It has been defined as a zone of up to 5 km from the outer edge of the proposed corridor, or to the limit of the project's visibility, whichever is smallest. This is referred to as the Zone of Visual Influence (ZVI). The factors that most significantly influence the ZVI are topographic variation and land use or land cover, which could potentially expose or screen the proposed project from sensitive viewpoints. These factors also contribute to the character of the study area.

In order to follow a versatile and pragmatic approach, the study area is divided into two different Landscape Types (LTs). A LT is a unit in the study area that is similar in its landscape character and aesthetic value. The LTs are illustrated in Figure 5 - Figure 6 with Points of Interest (POI) shown on the maps.

A Landscape Character Assessment (LCA) identifies and describes the comprising attributes and their qualities/values in the study area. It recognises that a landscape consists of interconnected systems, patterns and individual components that is defined by the natural, cultural and historical aspects of the region. Vorel et al (2006) states that “the character of a certain landscape segment is the result of the interplay of natural attributes (especially morphology, water bodies, character of vegetation), cultural attributes (land use, form and structure of built-up areas, individual buildings and their relationship with the surrounding landscape, the cultural value of the place) and historical attributes (the presence of elements and textures that bear witness to the historical development of a landscape and its continuity).”

Globally, pristine and semi-natural¹ environments are severely under pressure and a small percentage of intact and undisturbed ecosystems remain. Natural environments are considered finite visual resources due to the pressures of modern day development and ecosystem transformation. Similar to other natural resources, a visual resource has a value to a group of people / observers, which in this case is an aesthetic value. An aesthetic value can be described as the degree of appreciation for the qualities associated with a visual resource and refers to the sensory experience one has when exposed to the perceivable landscape attributes.

¹ Semi-natural environments are environments that have experienced some transformation but its general condition remains natural. Pristine natural environments have no visible signs of human interference or transformation.

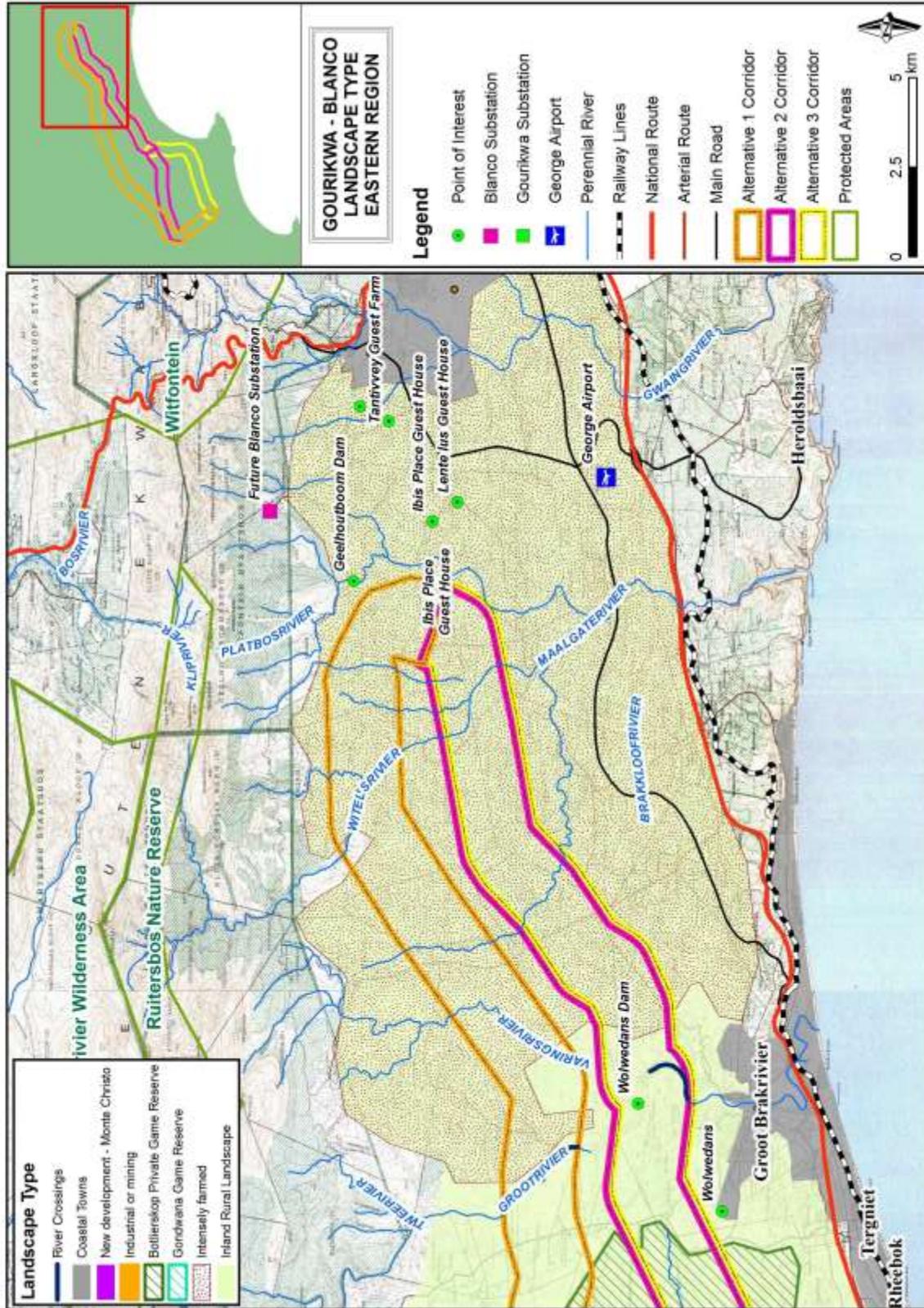


Figure 5: Landscape types in eastern region

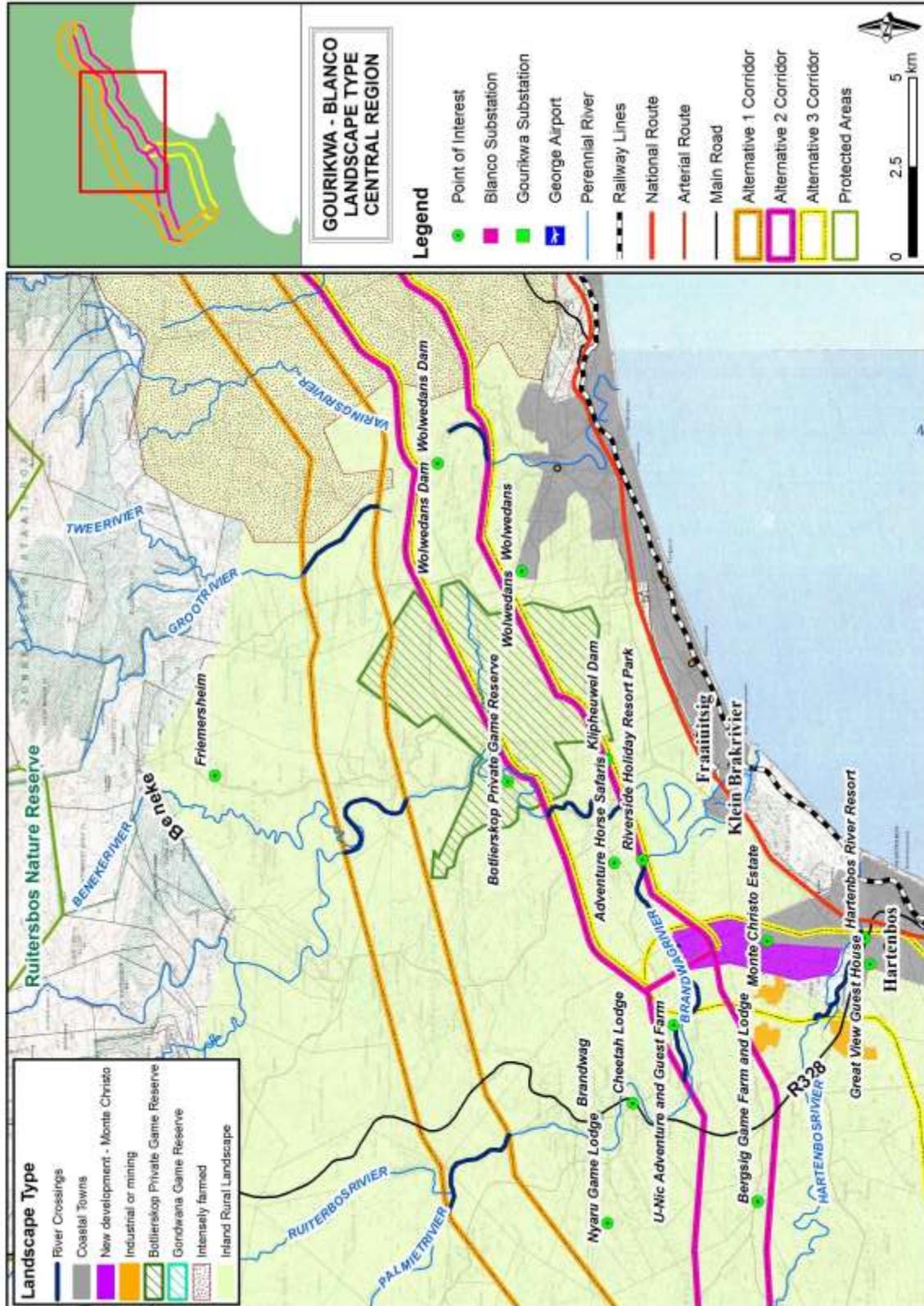


Figure 6: Landscape Types in central region

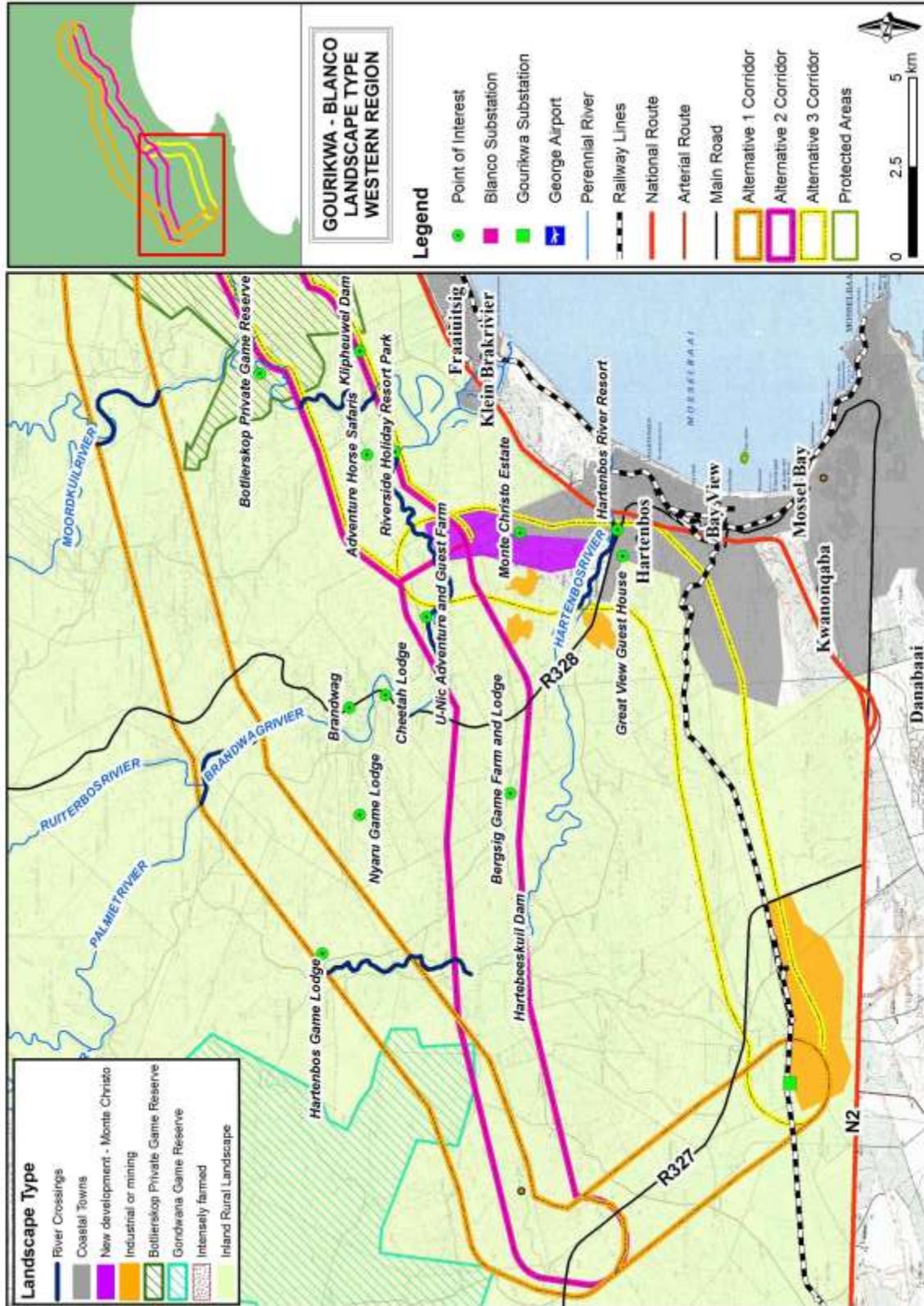


Figure 7: Landscape Types in western region

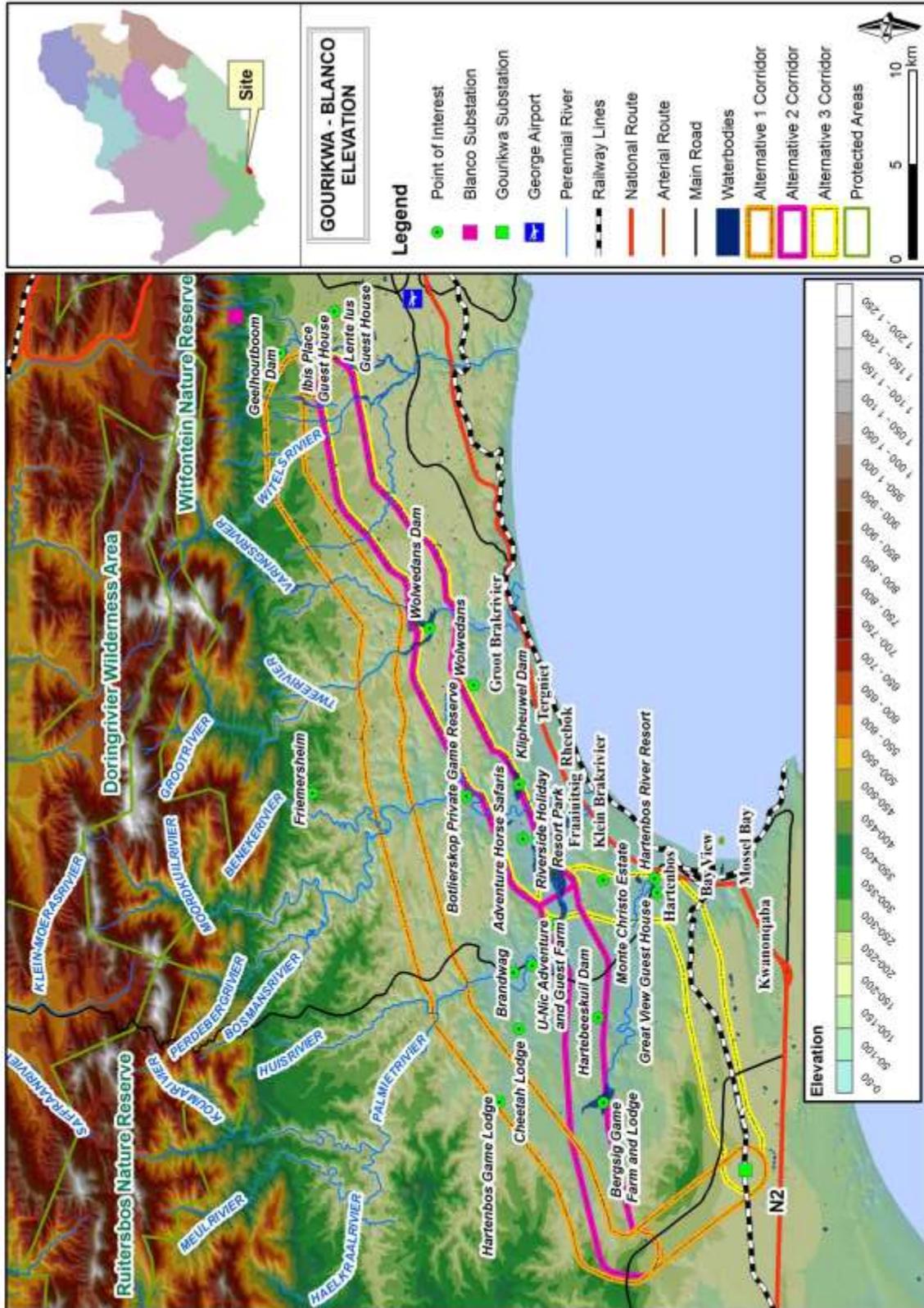


Figure 8: Elevation map

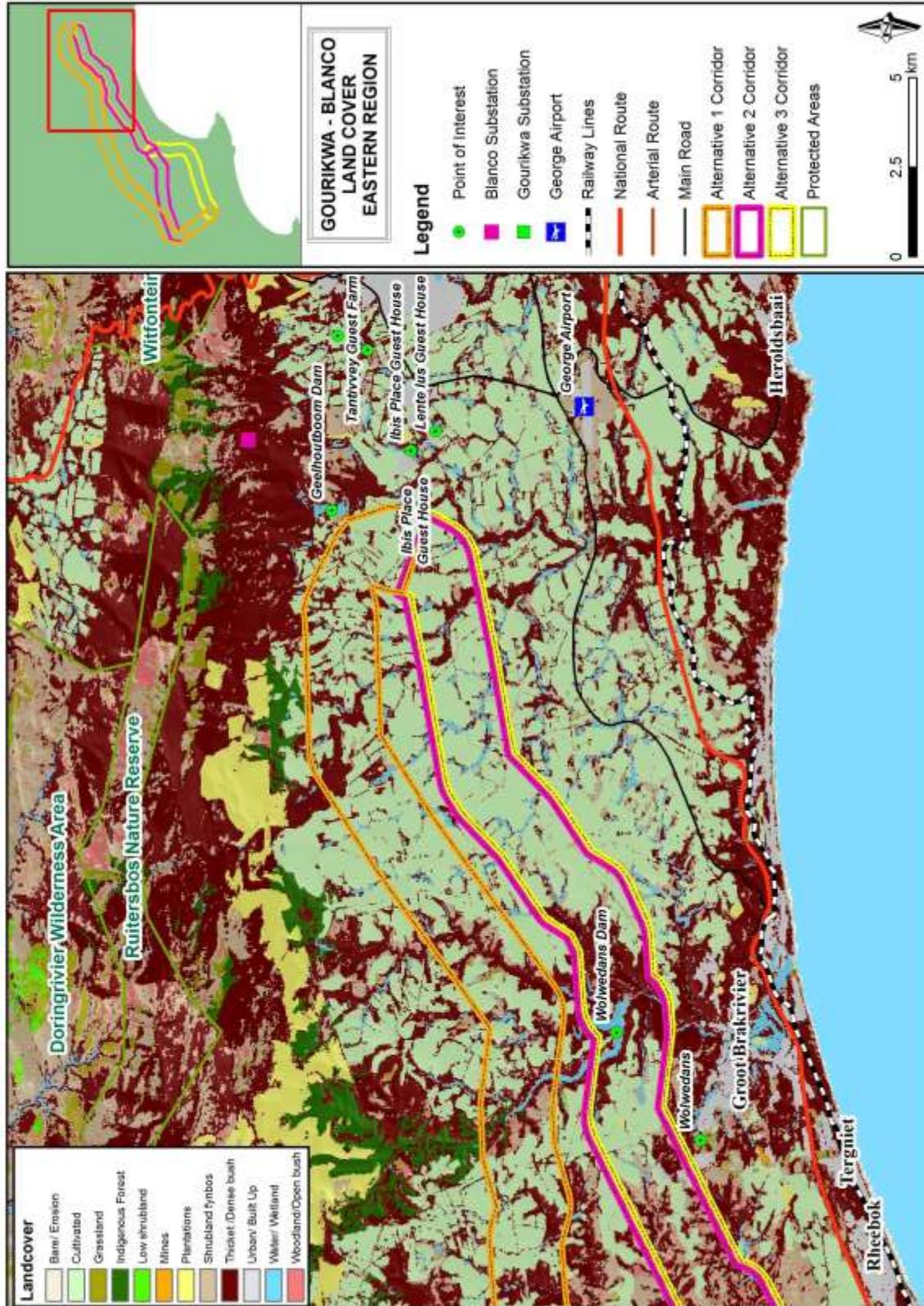


Figure 9: Land cover map of eastern region

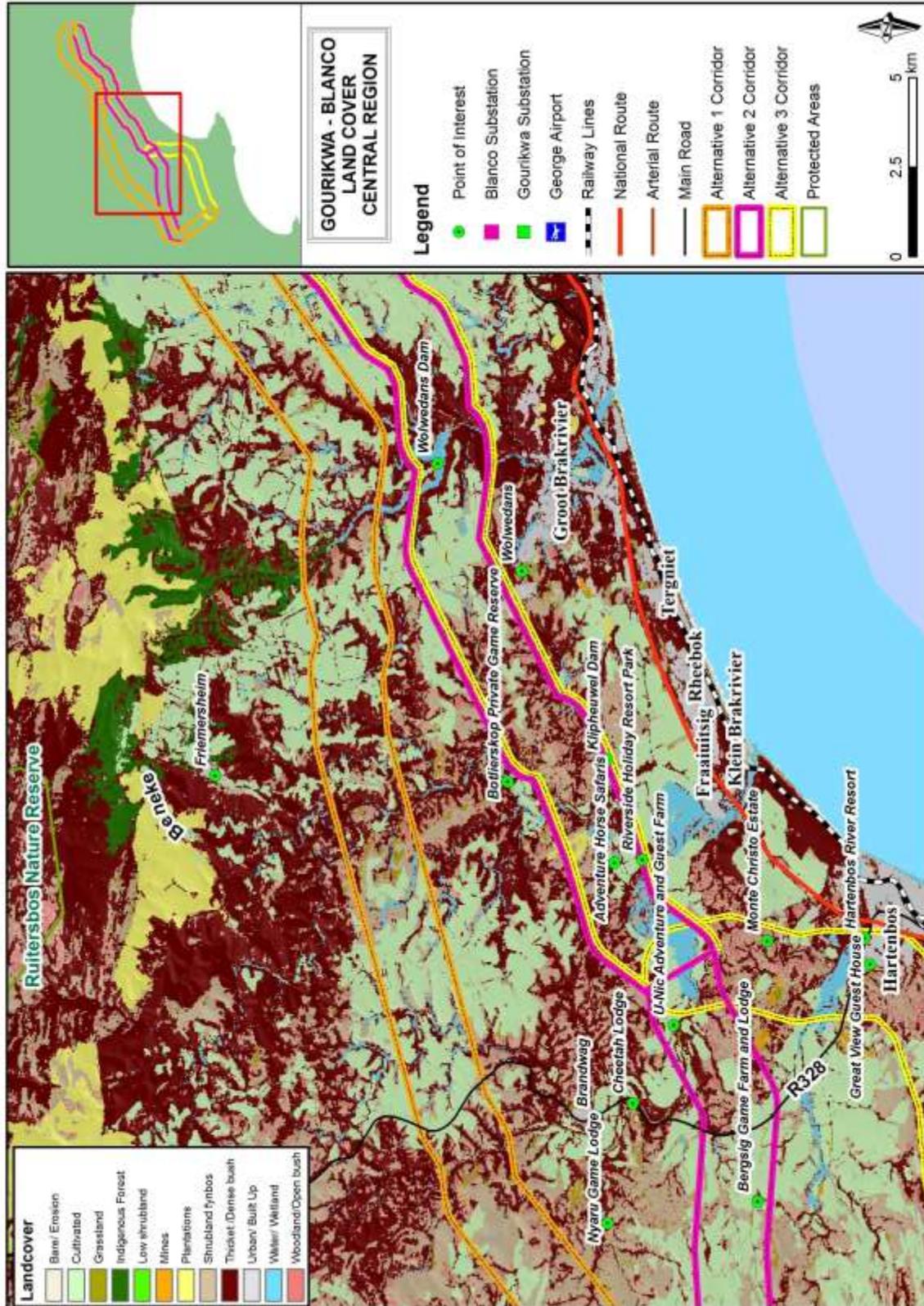


Figure 10: Land cover map of central region

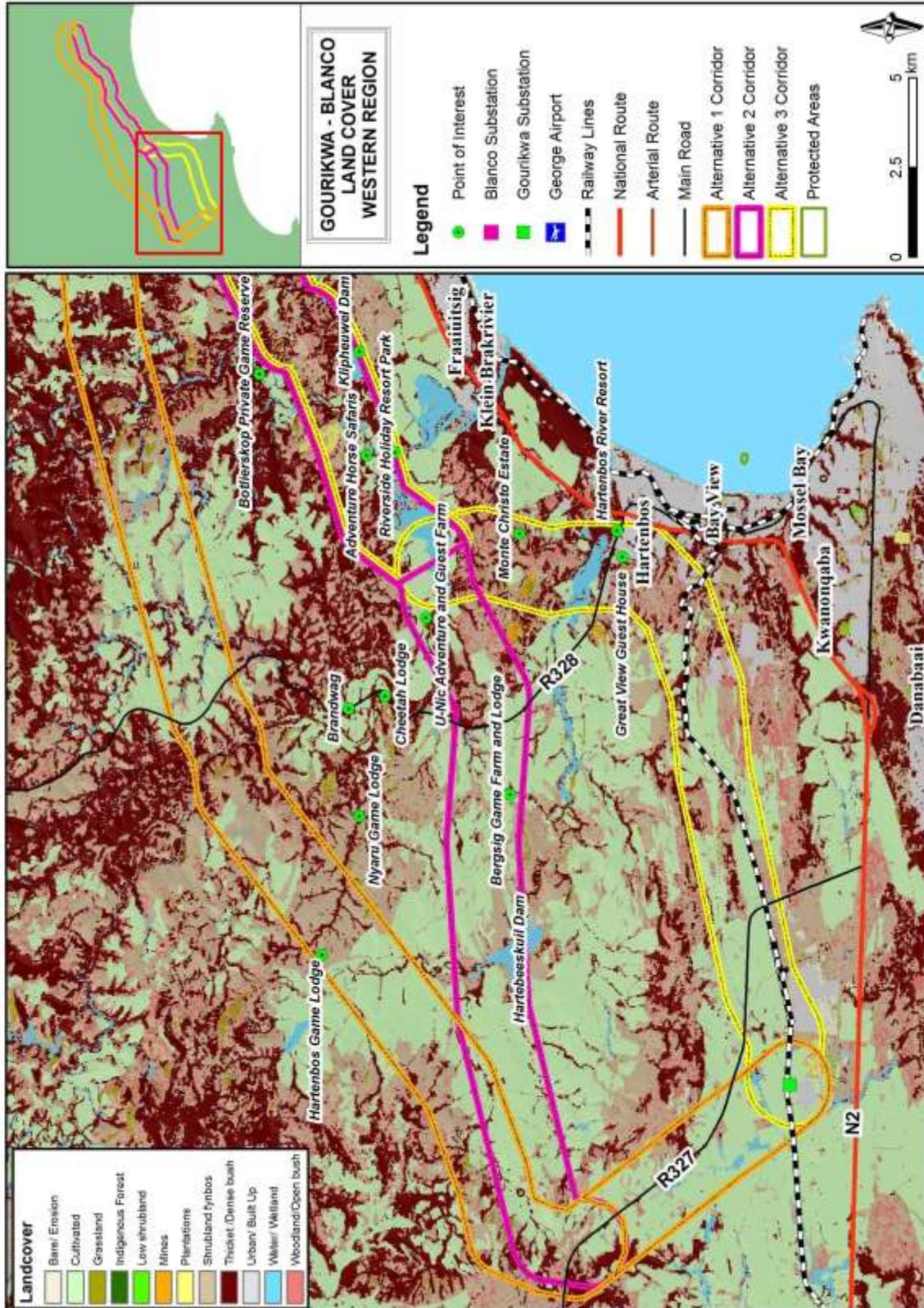


Figure 11: Land cover map of western region

6.2 COASTAL TOWNS

Introductory notes	This LT is limited to the coastal region and forms a very small part of the study area. The most densely populated areas are along the coastline, with the Town of George located further inland. George is considered outside of the study area with the western part of Blanco situated on the perimeter of the study area. This LT will not be affected by Alternative 1 and 2, but Alternative 3 brushes past the western and northern outskirts of Hartenbos.
Topography	The coastal towns are mostly situated on the relatively even and undulating shores of the Indian Ocean, but have also protruded into the more varied inland areas. Many of the towns such as Klein Brak, Glentana and Hartenbos, to name a few, use to be small holiday towns that was built on the even and accessible areas directly along the coastline. The N2 could be seen as a division between the initial settlements and the recent developments that are forced to locate inland where the topography is varied with low hills and valleys. The city of George is located further away from the coast line, on a plain, but its northern parts extend up the foothills of the Outeniqua Mountain Range. Blanco is on the perimeter of the study area and are partly on the foothills but extends onto the level plain towards the west and south.
Vegetation	The coastal towns of Mossel Bay, Hartenbos, through to Glentana has transformed the natural landscape to a great extent and isolated pockets of natural vegetation remain along the coastline. The natural vegetation varies between Canca Limestone Fynbos and Cape Seashore vegetation (Mucina & Rutherford, 2006) which are generally recognized by medium sized dune shrubs that grow densely in the area behind the sandy shores. The more established town areas consist of dense garden vegetation which is a mixture of exotic and endemic species. George is located further away from the coast and features Garden Route Granite Fynbos (Mucina & Rutherford, 2006) as a natural vegetation cover. The town development has transformed the natural landscape to a large extent and pockets of natural vegetation can be found in the open spaces. Generally, the town landscape is transformed with exotic garden plants.
Land use	What use to be placid holiday towns, have developed into established communities. A peaceful atmosphere prevails but changes to a vibrant holiday atmosphere when thousands of tourists gather over holiday seasons. The towns developed rapidly along the coast and have been forced inland to accommodate the influx of permanent residents and holidaymakers. The predominant land use is residential, with commercial and light industrial development along the N2 highway. Due to the high tourism potential, many holiday resorts and privately owned guest houses are located in the towns, mostly close to the beaches. Further extensions are planned north of Hartenbos as part of the existing Monte Christo Estate and it can be expected that more outlying areas will be developed in future. The western part of George consists of the suburb of Blanco and the Fancourt Golf Estate and Country Club. Agricultural Holdings (AH) and small farms occur along the north-western outskirts of George where small-scale and high intensity agriculture are practiced. The most prominent industrial development is west of Mosselbay, at the Gourikwa Substation. Mossdustria is a relatively large industrial complex with several industries concentrated on a 650ha site. Gourikwa Substation forms part of this complex. A couple of quarries can be noticed northwest of Hartenbos, but are located between the hills and are fairly unobtrusive.
Degree of naturalness/transformation	The Coastal Towns LT is greatly transformed as a result of urbanisation. Pockets of semi-natural ecosystems remain between the residential areas and towns, but are being encroached on by new town extensions. Development is creeping inland due to a lack of available land along the coastline. A couple of river mouths occur along the coastline that are considered ecologically sensitive and add to a natural character.
Points of interest	The entire study area is within the Garden Route which is considered a particularly scenic and ecologically diverse part of the South African coastline. It features numerous attractions and offers a myriad of tourist activities. All the coastal towns can be classified as POI as they are popular tourist destinations. Most of the tourist attractions and activities occur along the beaches and overnight accommodation and camping are situated where views of the ocean can be experienced. The Hartenbos River Resort and Great View Guesthouse are within the proposed Alternative 3 corridor.

Landscape exposure	The topography has a general downward gradient from the interior towards the coast. The high lying interior often forms a level plain or plateau, forming relatively steep slopes before flattening out into a coastal plain. A thin strip along the coastline is considered even topography but the interior has hilly and undulating topography. The towns have extended into the hillier terrain where landscape exposure is considered medium.
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6.3 INLAND RURAL LANDSCAPES

Introductory notes	The largest part of the study area consists of the Inland Rural LT and occupy the area between the coastline and the Outeniqua Mountains. It is a landscape with diversity but its rural character and similar agricultural practices create a uniformity over the entire area. For discussion purposes, the Inland Rural LT is subdivided into a western, central and eastern region. Isolated areas or features can be highlighted as different or unique. These are identified as the large water bodies namely; Hartebeeskuil-, Klipheuwel- and Wolwedans Dams, the major rivers such as Groot Brak-, Moordkuil-, Brandwag- and Hartenbos Rivers and the reserves and game lodges that conserve the natural landscapes.
Topography	The Outeniqua Mountain Range is north of the study area and is a particularly scenic landscape feature with high mountain peaks and pristine natural vegetation. The Blanco Substation is located on the even plain below the foothills of the mountain range. Generally, the topography consists of hilly terrain and undulating landscapes with numerous streams and river systems originating from the Outeniqua Mountain Range. Deep valleys and numerous dams occur in the inland rural regions. The eastern region between Groot Brak River and George is markedly more even than the central and western regions. This area consists of large plains that are suitable for major cultivation practices. The region near Gourikwa Substation are also flat but becomes increasingly more varied towards the interior.
Vegetation	Large parts of the study area are intensely farmed with irrigated pastures and grassy fields. This is particularly noticeable in the area between George and Groot Brak River. This can be attributed to the even terrain that is suitable for cultivation. Particular areas west of the Groot Brak River, are also intensely cultivated, but the pattern is fragmented due to the varied terrain. Private game farms in the central and western regions conserve large areas of the natural vegetation and restoration of natural habitats are also noticeable. The naturally occurring vegetation is mostly that of the Garden Route Fynbos vegetation type (Mucina & Rutherford, 2006) and consists of low growing Fynbos and Protea species. Riverine vegetation is consistent with Cape Lowland Alluvial vegetation (Mucina & Rutherford, 2006) with reeds and small trees. Alien species and exotic woodlands are also noticeable in some regions, especially along the rivers and in the valleys.
Land use	The predominant land use is cultivated pastures and livestock farming. Private game farms and lodges are noticeable in the central and western regions of the study area, of which Gondwana- and Botlierskop Game Reserves are the largest. Small holdings are present along the outskirts of the coastal towns. A relatively sparse dirt road network is present in the Inland Rural Landscape. The R328 connects the towns of Mosselbay and Oudsthoorn via the scenic Robinson Pass.
Degree of naturalness/transformation	The eastern region is intensely farmed and very little of the natural vegetation occur. It is greatly transformed by cultivated fields with natural and semi-natural systems limited to the valleys of large rivers. The central region consists of a reasonable percentage of cultivation, but due to the varied topography, natural ecosystems are more readily found. Botlierskop Game Reserve conserves approximately 3500ha of natural and semi-natural ecosystems. In the western part of the study area, Gondwana Game Reserve and Hartenbos Game Lodge conserve 4000ha and 860ha respectively. These areas are considered natural, although fragmented cultivation occur between the reserves. Nearer to Gourikwa Substation, the topography levels out and cultivation occur at large scale.
Points of interest	This area is part of the Garden Route and is wedged between the scenic Outeniqua Mountain Range and the very popular coastal towns. The regional tourism industry has developed to not only offer activities along the coastline, but also managed to add major tourist attractions in the

	<p>interior in the form of luxury accommodation, game farms and other outdoor activities. POI are more concentrated in the western and central regions where most of the game farms are located. Other outdoor activities are presented such as skydiving, horse riding trails, hiking, etc. Large dams namely, Hartebeeskuil-, Klipheuwel- and Wolwedans Dam, offer fishing and birding opportunities while enjoying the rural character. In the eastern region POI are limited to a couple of guest houses nearer to Blanco. This area is mostly farms but still offer scenic views towards the Outeniqua Mountains to the north.</p>
<p>Landscape exposure</p>	<p>The even areas in the eastern region and the areas near Gourikwa Substation are considered to have a high landscape exposure and panoramic views are consistently experienced. The central and western regions have an undulating topography with deeply fissured valleys. Generally, these regions are considered to have medium landscape exposure.</p>



Figure 12: View from Robertson Pass over study area



Figure 13: View towards Outeniqua Mountains



Figure 14: Aerial perspective of pasture fields and semi-natural landscape

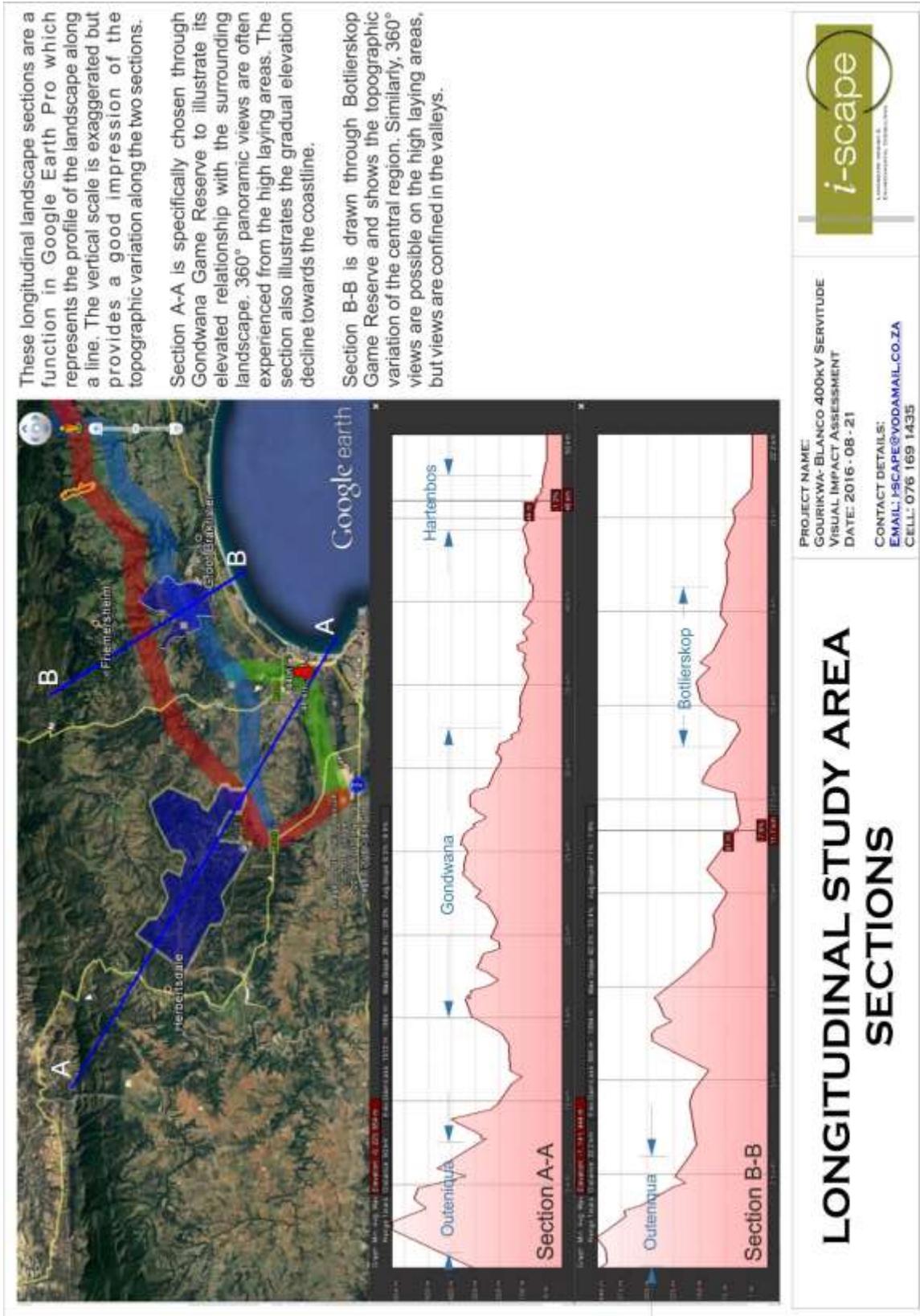


Figure 15: Longitudinal Landscape Sections



PROJECT NAME:
GOURIKWA-BLANCO 400KV SERVITUDE
VISUAL IMPACT ASSESSMENT
DATE: 2016 - 08 - 21

CONTACT DETAILS:
EMAIL: HSCAPE@VODAMAIL.CO.ZA
CELL: 076 169 1435

LONGITUDINAL STUDY AREA SECTIONS

7 VISUAL IMPACT ASSESSMENT

7.1 INTRODUCTION

A VIA is a specialist study that assesses the potential visual changes/impacts to an existing baseline setting resulting from the implementation of a proposed project. This implies that, firstly, a baseline must be established and secondly, the visual change, resulting from the project, must be compared to the baseline. The quantification of the visual change is referred to as the severity of the impact and is a function of:

- The nature of the impact;
- The probability of the impact occurring;
- The duration of the impact;
- The extent of the impact; and
- The magnitude of the impact.

The essence of determining the significance of a visual impact centres on the severity of the potential impacts, and the sensitivity of the affected receptors. In simple terms, a low severity impact affecting receptors of low sensitivity will result in a low significance. On the other end of the scale, a highly severe impact, affecting highly sensitive receptors, will result in a high significance. This is illustrated in Table 1 and more thoroughly discussed in Appendix 3.

Table 1: Impact significance matrix

	Impact severity					
		Very high	High	Medium	Low	Very low
Receptor sensitivity	Very high	Substantial	Major	Major/Moderate	Moderate	Moderate/Minor
	High	Major	Major	Moderate	Moderate/Minor	Minor
	Medium	Major/Moderate	Moderate	Moderate/Minor	Minor	Minor/Negligible
	Low	Moderate	Moderate/Minor	Minor	Minor/Negligible	Negligible
	Very low	Moderate/Minor	Minor	Minor/Negligible	Negligible	Negligible/None

7.2 BASELINE ESTABLISHMENT

The baseline environment provides the premise from which the visual change can be evaluated. The study area is assessed in Section 6 and provides a description of its landscape character. Section 7.3.3 addresses the aesthetic value and the landscape sensitivity across the different landscape types.

7.3 VISUAL AND LANDSCAPE RECEPTORS

Within the study area observers experience and interact differently with their environment, and therefore value it differently. They may be affected by the proposed project due to additions or alterations in the visual environment which may influence their experience and views of the visual resource. In this study a distinction is made between impacts on the **observers** and impacts on the **visual resource**. The observers represent all people that may be affected visually, while the impacts

on the visual resource strictly assess the changes to the landscape character and the impact on its visual value.

7.3.1 OBSERVER SENSITIVITY

The main observer groups in the study area are residents, tourists and motorists. The categorisation implies that the observers in that particular category will experience and appreciate the visual resource in a fairly similar fashion and will therefore have a similar sensitivity.

The sensitivity of an observer can be described according to the following factors:

- The value an observer has for the particular visual resource being impacted on;
- The duration of exposure to the impact; and
- The distance of an observer from the source of impact (Refer to Section 4.2).

To determine viewer sensitivity, a commonly used rating system is utilised (Table 2). This is a generic classification of observers and enables the Visual Specialist to establish a logical and consistent viewer sensitivity rating for viewers who are involved in different activities without engaging in extensive public surveys.

Public Participation Comments

Often the general acceptance or non-acceptance of a project will be reflected in Public Participation events and is considered a valuable indicator of the true viewer sensitivity. The proposed transmission line has received a great deal of criticism, particularly from residents and tourism operators in the study area. The criticism is motivated by negative sentiments due to historical encounters with the applicant, but also issues revolving around health, safety, loss in property value, interference with current land use practices, ecological impacts, etc. The comments that are relevant to this study are specific to issues that causes visual intrusion on observers' views, and the loss in scenic quality of the visual resource. The comments confirm that residents and tourist operators, speaking on behalf of tourists, are highly sensitive, and therefore is consistent with the categorisation of Table 2.

A brief summary of concerns that were received during the input sessions with I&APs is provided below:

- The transmission line will negatively impact on photographic potential of the landscape;
- The transmission line will spoil the natural environment and therefore decrease the scenic quality of the visual resource;
- The construction process will cause unsightly disturbances that could lead to eyesores due to a lack of proper mitigation;
- Land values may decrease due to visual impact from transmission lines. This is interpreted as an issue relating to the decrease in aesthetic value, as many properties are developed in such a way as to take advantage of scenic views;
- Poor maintenance and aftercare of the servitude that results in eyesores; and
- Negative impact on eco-tourism. This relates to an issue of aesthetic value where tourism activities centres around the scenic quality of the environment.

Table 2: Viewer Sensitivity

VIEWER SENSITIVITY	DEFINITION (BASED ON THE LANDSCAPE INSTITUTE, 2002 ED PP90-91)
High	Views from major tourist or recreational attractions or viewpoints promoted for, or related to the appreciation of the landscape, or from important landscape features. Users of all outdoor recreational facilities including public and local roads or tourist routes whose attention or interest may be focussed on the landscape; Communities where the development results in changes in the landscape setting or valued views enjoyed by the community; Residents with views affected by the development; People generating an income from the visual resource or pristine quality of the environment.
Medium	People engaged in outdoor sport or recreation (other than appreciation of the landscape); People commuting between work place and home or other destinations that do so at regular intervals.
Low	People at their place of work or focussed on other work or activity; Motorists travelling at high speed with their focus placed on the road ahead.

One of the aspects that influences the severity of the visual impact is viewer incidence. Viewer incidence is a measure of determining the frequency and number of observers viewing the proposed project. Due to a lack of quantitative data, the rating is based on an arbitrary scale from high to low, specifically designed for this project:

- For a **high** viewer incidence to occur the corridor should be located within 1 km of a relatively densely populated area, cross or run parallel to a major national road, and/or pass through a recognised public gathering area such as an acclaimed tourist attraction;
- A **medium** viewer incidence occurs if the servitude is within 2 km of a densely populated area, crosses through or adjacent to a moderately densely populated area such as a rural town or agricultural holdings, or passes through an area with a secondary road infrastructure; and
- A **low** viewer incidence occurs if the servitude passes through vacant-/farmland with no or limited populated areas within 2 km, and only a tertiary road network is present.

Viewer incidence is addressed in the visual impact severity tables in Sections 7.4 - **Error! Reference source not found.**

Coastal Towns

Affected receptors:

- Permanent residents of the coastal towns are considered highly sensitive due to their sustained exposure to the potential visual impacts and their attentive interest towards their living environment. Those that may be affected by Alternative 3 reside west of the N2 in the Hartenbos extensions of Vyf-Brakke Fonteinen, Hartenbos Hills and Monte Christo Estate. Houses are mostly build to face into the direction of a visually pleasing view. The houses on the west and south facing slopes are directed towards views of the ocean, i.e., away from the proposed route. Houses that have no ocean view often face other natural features such as valleys, rivers or mountains. This is the case with many of the properties in Vyf-Brakke Fonteinen and along Geelhout and Kameeldoring Streets in Hartenbos Hills. The community of Wolwedans, north of Groot Brak, will be affected by Alternative 2.

- Tourists are generally considered highly sensitive. Their main reason for visiting the study area is often related to the outdoor activities associated with the beach. The beach zone is considered outside of the ZVI. Tourists may travel or temporarily stay near Alternative 3 where two accommodation facilities have been identified, namely Great View Guest House and Hartenbos River Resort. Their exposure to the potential visual impact is generally short.
- Motorists travelling on the N2 may be exposed to glimpses of Alternative 3 but the intrusion on their views are expected to be insignificant. Those that travel on the R328 will cross Alternative 3 outside of Hartenbos. Their sensitivity is considered low as their attention is generally focussed on the road and their exposure to roadside objects is brief due to the speed they travel.

Distance from sensitive viewpoints:

- Alternative 3 is within 1 km from the western and northern outskirts of Hartenbos and passes near Vyf-Brakke Fonteinen, Hartenbos Hills and Monte Christo Estate. It also crosses the R328 which is considered a major transport route to Oudsthoorn;
- Great View Guest House and Hartenbos River Resort are two tourist destinations that will be impacted and are located within the ZMVE of Alternative 3; and
- Alternative 2 passes within 1 km north of Wolwedans community and the small holdings near Wolwedans Dam.

Inland Rural Landscapes

Affected receptors:

- Farming communities are scattered across the Inland Rural LT. The eastern part, between Groot Brak River and George, consists of smaller farm portions and a higher concentration of farm residents are expected in this region. West of the Groot Brak River, the farms are generally larger with the exception of small holdings near Wolwedans Dam and the western outskirts of Hartenbos. These residents are considered highly sensitive due to their sustained exposure to the potential visual impacts and their attentive interest towards their living environment.
- Several tourist destinations are present in the study area, mostly in the form of game reserves and lodges. Accommodation is offered and tourists are entertained with game drives, horse rides and other outdoor activities. Other tourist attractions are the three large dams in the study area namely, Wolwedans-, Klipheuwel- and Hartebeeskuil Dams. Fishing and birding are considered some of the activities offered at these locations. In all of the aforementioned cases, tourists enjoy the outdoor environment with an expectation of high visual qualities and scenic views. Tourists are regarded as viewers with a high sensitivity. Their reason for visiting is to experience the outdoor environment and scenery offered by the natural environment.
- The study area is considered to have a sparse primary and secondary road network but a more intricate tertiary network of gravel roads. The main roads that are crossed by the alternative alignments are the R327 and R328. None of them are formally recognised scenic routes although pleasant scenes are experienced of the landscape and in particular of the Outeniqua Mountains. Motorists' exposure to the power lines will be momentarily and their sensitivity are considered low, due to the speed at which they travel and the short visual exposure. The secondary and tertiary roads are mostly travelled by the farmers that reside in the area. Their sensitivity is considered higher as they experience a much greater exposure to the source of impact as they travel the roads regularly.

Distance from sensitive viewpoints:

- Alternative 1 is within 1 km of the following sensitive viewpoints:
 - It is parallel to the R327 and crosses over the road near the entrance to Gondwana Game Reserve;
 - It traverses the southern section of the Gondwana Game Reserve;
 - It passes through Hartenbos Game Lodge;
 - It crosses over the R328, north of Brandwag;
 - It traverses the northern section of Botlierskop Game Reserve; and
 - It impacts on all the farm residents within the ZMVE of the alignment.
- Alternative 2 is within 1 km of the following sensitive viewpoints:
 - It is parallel to the R327 and crosses over the road near the entrance to Gondwana Game Reserve;
 - It passes south of the Gondwana Game Reserve;
 - It crosses over the southern parts of the Hartebeeskuil Dam;
 - It passes north of Bergsig Game Farm and Lodge;
 - It crosses over the R328, south of Brandwag;
 - The corridor passes near to U-Nic Adventure and Guest Farm, Riverside Holiday Resort Park and Adventure Horse Safaris, between R328 and Klipheuwel Dam;
 - It crosses over the Klipheuwel Dam;
 - It traverses through the central region of Botlierskop Game Reserve;
 - It crosses the Wolwedans Dam; and
 - It impacts on all the farm residents within the ZMVE of the alignment.
- Alternative 3 is within 1 km of the following sensitive viewpoints:
 - It crosses the R327 north of Mossdustris;
 - It passes the western and northern outskirts of Hartenbos;
 - It crosses the R328 west of Hartenbos;
 - The corridor passes near to U-Nic Adventure and Guest Farm, Riverside Holiday Resort Park and Adventure Horse Safaris, between R328 and Klipheuwel Dam;
 - It crosses over the Klipheuwel Dam;
 - It traverses through the central region of Botlierskop Game Reserve;
 - It crosses the Wolwedans Dam; and
 - It impacts on all the farm residents within the ZMVE of the alignment.

7.3.2 SENSITIVE AND REPRESENTATIVE VIEWPOINTS

The photo sets in Appendix 2 are selected as representative views of a region or specific viewpoints that are deemed sensitive. The purpose of the photographs is to record the baseline condition of the environment, and to understand the impact of a new power line. It also recognises that viewers experience the landscape in different ways and are exposed to the impacts in varying degrees. An infinite number of viewpoints can be chosen, but to keep the study precise and pragmatic, only highly sensitive and representative views are selected.

The photo sets in Appendix 2 illustrate the baseline condition taken from various locations in the study area. It identifies prominent features in the landscape.

7.3.3 LANDSCAPE CHARACTER SENSITIVITY

The sensitivity of a landscape's character is a measure of the robustness of its character and the ability of the landscape to accommodate certain changes without detrimental impacts to its qualities.

A landscape character with a high sensitivity will typically have one or a combination of the following attributes:

- A low Visual Absorption Capacity (VAC);
- A high degree of inter-visibility with adjacent landscapes;
- A well-established identity and sense of place;
- Is often in a pristine natural condition with high ecological value that contributes to a valued aesthetic condition; and
- Is considered scarce or uncommon.

A landscape character with a low sensitivity will typically have one or a combination of the following attributes:

- A high VAC;
- Is often visually isolated with a low degree of inter-visibility with adjacent landscapes;
- A poorly established identity and sense of place;
- Is often greatly developed to an extent where no or very little aesthetic features exist; and
- Is considered common and found in numerous places.

Coastal Towns

The only alternative that will cause a significant impact on this LT is Alternative 3 where its corridor intersects with the western regions of Hartenbos. Should the transmission line follow this route it will not affect the existing settlement patterns, but future development will have to allow for a safe 55m wide servitude which will impact on settlement patterns. The Coastal Towns LT is considered a landscape with **medium** sensitivity along its western outskirts. It is considered a transition zone between the urban and rural landscape.

- Generally, the study area has a medium VAC due to the varied landscape further away from the coastline. The low growing natural vegetation does little to contain views and panoramic views can be experienced from high laying areas. The degree of inter-visibility varies across the study area as elevated vantage points provide distant panoramic views, but views in a valley are often contained;
- The identity of the coastal towns is generally recognised for simple one or two storey houses overlooking the Indian Ocean, and a relaxed holiday sense of place. Some of the newer developments are upmarket and the architecture style is often modern. As mentioned before, the towns have transformed from previously small and intimate holiday destinations, to well established coastal towns with a large percentage of permanent residents and a commercial component. A lack of available space along the coastline has forced development to establish further inland. The character of the towns is gradually transforming as urban development encroaches on the open space;
- The coastal towns are densely developed along the coastline, but fractured development is present north and west of the N2 in the ZMVE of Alternative 2&3. Vyf-Brakke Fonteinen is a small holding west of Hartenbos between the N2 and the Mossel Bay Airfield. Monte Christo is an upmarket development on the Farm Hartenbosch 217 and has plans to extend northwards to the Farm Outeniquasbosch 149. Wolwedans is situated north west of Groot

Brak with small holdings scattered around the Wolwedans Dam. These developments experience some of the rural character of the Inland Rural LT and views of the hills and naturally occurring vegetation adds value to the outskirts developments;

- Available space for property development along the coastline is a scarce resource, therefore towns are expanding into the rural landscapes on the outskirts. Views of nearby hills, valleys and even distant views of the Outeniqua Mountain Range add value to the properties. These scenes are considered limited and scarce in its region; and
- Other power lines are located in the proposed corridors of Alternative 2&3. It provides a baseline condition that is already impacted by power infrastructure but is also nearer to a visual intolerance threshold.

Inland Rural Landscapes

The Inland Rural LT is considered **moderate to highly** sensitive. The highly sensitive regions are in the western and central regions where a concentration of visual amenities are present. The eastern region is moderately sensitive due to its intensely farmed land use, but individual features are considered highly sensitive:

- VAC varies across the study area but generally a medium to high VAC is experienced in the western and central regions, with a moderate to low VAC present in the eastern region. High variation levels occur in the terrain near to the Outeniqua Mountains and along some of the major rivers, all the way down to the coast. Very flat, plateau conditions are present between Groot Brak River and George (Eastern region) and near the Gourikwa Substation, extending west. Vegetation cover provides limited screening potential in the intensely cultivated areas of the eastern and Gourikwa Substation regions, and on the level terrain of the western and central regions. Exotic woodlands often occur in the study area, providing localised screening;
- Inter-visibility is limited in the central and western regions due to the varied terrain. Panoramic views can be experienced from high laying areas. The level terrain in the eastern region and around Gourikwa Substation facilitates high levels of inter-visibility and distant views can be experienced;
- Pristine and semi-natural environments are fragmented with the game reserves protecting large portions of the natural vegetation. Natural river vegetation can be seen in the numerous small tributaries and valleys, but is often mixed with exotic trees. The intensely cultivated eastern region is greatly transformed and semi-natural ecosystems are limited to steep slopes and valleys of which there are few;
- The entire study area is part of the Garden Route and is renowned for its scenic views and entertainment value. Luxury accommodation and outdoor activities are mostly present in the western and central regions and offer unique interactions with the natural environment. The scenic quality and natural character of the landscape is highly valued and are considered a scarce resource in the region; and
- A couple of existing power lines are present in the Inland Rural LT of which the largest power line is the 400kV Proteus-Droërivier that follows a similar alignment as Alternative 1. Two lower voltage distribution lines follow a similar route as Alternative 2 (known as Proteus – Blanco) and a single distribution line follows Alternative 3. It provides a baseline condition that is already impacted by power infrastructure, but is also nearer to a visual intolerance threshold.

7.4 VISUAL IMPACT SEVERITY – COASTAL TOWNS LANDSCAPE TYPE

ALTERNATIVE 3: COASTAL TOWNS LANDSCAPE TYPE - OBSERVERS		
	Without mitigation	With mitigation
Construction phase		
Nature of impact: The construction activity will cause a negative effect on observers in the ZMVE during the initial construction activity that will be limited to surface disturbances. As the towers gain height, the visibility and visual exposure will increase progressively. Viewer incidence is expected to be high due to the proximity to an urban area and the crossing of the R328. A visual change will occur and will become progressively more substantial as the project nears completion. It will cause a visual intrusion as a result of disturbances to the natural and semi-natural vegetation that relates to tower construction and servitude clearance. The construction activity is considered an uncharacteristic event in the study area that may impact on scenic views.		
Probability	Highly probable (4)	Highly probable (4)
Duration	Very short term (1)	Very short term (1)
Extent	Local, but over long linear distance (3)	Contained on site, but over long linear distance (2)
Magnitude	Low (5)	Low (4)
Severity	Medium (36)	Low (28)
Status (Positive/Negative)	Negative	Negative
Operational phase		
Nature of impact: A new transmission line will be added to the visual environment. It is expected to be partially visible due to the varied topography, although those within the ZMVE will be most severely affected as a result of their proximity. Viewer incidence is expected to be high due to the proximity to urbanised areas and the crossing of the R328, a major transport route. A visual change will occur as a result of the new transmission line and the increased dominance of electrical infrastructure in the study area. The industrial character will contrast with the rural character of the western outskirts. It will interfere with pleasant views of the natural and semi-natural landscape and will intrude on the observer's visual experience.		
Probability	Definite (5)	Definite (5)
Duration	Long term (4)	Long term (4)
Extent	Regional (3)	Regional (3)
Magnitude	High (8)	Medium (6)
Severity	High (75)	High (70)
Status (Positive/Negative)	Negative	Negative
Reversibility	Medium	Medium
Irreplaceable loss of resources?	Medium	Medium
Can impacts be mitigated: Impacts can be mitigated during the construction phase, but little can be done to mitigate the impacts during the operational phase unless major layout or design changes are made to avoid the potential impacts.		
Mitigation: Refer to Section 8		
Cumulative impacts: Cumulative impacts are highly likely due to the existing distribution line that follows a similar corridor as Alternative 3 and an existing substation next to the R328. The		

<p>prominent scale of the new 400kV transmission line is a large addition to electrical infrastructure in the area. A significant increase (more than double) in visual dominance of electrical infrastructure can be expected which contrasts with the rural character of the urban outskirts, thereby causing a visual intrusion.</p>
<p>Residual Risks: Residual risks will occur as the visibility of the power line cannot be effectively reduced, and therefore visual intrusion will remain an impacting factor for the lifetime of the project.</p>

ALTERNATIVE 3: COASTAL TOWNS LANDSCAPE TYPE – VISUAL RESOURCE		
	Without mitigation	With mitigation
Construction phase		
<p>Nature of impact: The construction activity will cause a negative effect, primarily on the rural character of the outskirt development. For the duration of the construction phase, machinery, material and workforce will be uncharacteristic to the visual resource and will contrast with the semi-natural or farming practices along the urban outskirts. The construction activity is considered incompatible with the prevailing character and will blemish the visual value and scenic quality of the rural landscape.</p>		
Probability	Definite (5)	Highly probable (4)
Duration	Very short term (1)	Very short term (1)
Extent	Local (2)	Local (2)
Magnitude	Moderate (6)	Low (4)
Severity	Medium (45)	Low (28)
Status (Positive/Negative)	Negative	Negative
Operational phase		
<p>Nature of impact: A new transmission line will be a prominent addition to the baseline environment. The complex, industrial character and enormous scale of the towers, will contrast with the rural and semi-natural environment along the outskirts of the urban areas. Pleasant views of the surrounding landscape will be blemished which will reduce the scenic quality of the visual resource.</p>		
Probability	Definite (5)	Highly probable (4)
Duration	Long term (4)	Long term (4)
Extent	Regional (3)	Regional (3)
Magnitude	High (8)	Medium (6)
Severity	High (75)	Medium (52)
Status (Positive/Negative)	Negative	Negative
Reversibility	Medium	Medium
Irreplaceable loss of resources?	Medium	Medium
<p>Can impacts be mitigated: Impacts can be mitigated with limited success unless major design changes are considered.</p>		
<p>Mitigation: Refer to Section 8</p>		
<p>Cumulative impacts: Cumulative impacts are highly likely due to the existing distribution line that follows a similar corridor as Alternative 3 and an existing substation next to the R328. The prominent scale of the new 400kV transmission line is a large addition to electrical infrastructure in the area. A significant increase (more than double) in visual dominance of electrical</p>		

infrastructure can be expected which contrasts with the rural character of the urban outskirts, thereby causing a reduction in the scenic quality of the visual resource.
Residual Risks: Residual risks will occur, as the impact of the power line on the character of the study area cannot be effectively mitigated over the lifetime of the project.

7.5 VISUAL IMPACT SEVERITY – INLAND RURAL LANDSCAPE TYPE

ALTERNATIVE 1: INLAND RURAL LANDSCAPE TYPE - OBSERVERS		
	Without mitigation	With mitigation
Construction phase		
Nature of impact: The construction activity will cause a negative effect on observers in the ZMVE during the initial construction activity that will be limited to surface disturbances. As the towers gain height, the visibility and visual exposure will increase progressively. Viewer incidence is generally expected to be medium due to the route passing through rural areas that has a low to medium population density. Areas/points where higher viewer incidences are expected, are near major transport routes and at popular tourist attractions. A visual change will occur and will become progressively more substantial as the project nears completion. It will cause a visual intrusion as a result of disturbances to the natural vegetation and agricultural land uses that relates to tower construction and servitude clearance. The construction activity is considered an uncharacteristic event in the study area that may impact on scenic views.		
Probability	Highly probable (4)	Highly probable (4)
Duration	Very short term (1)	Very short term (1)
Extent	Local, but over long linear distance (3)	Contained on site, but over long linear distance (2)
Magnitude	Low (5)	Low (4)
Severity	Medium (36)	Low (28)
Status (Positive/Negative)	Negative	Negative
Operational phase		
Nature of impact: A new transmission line will be added to the visual environment. It will be highly visible on the level regions, but partially visible in the more mountainous regions. Viewer incidence is generally expected to be medium due to the route passing through rural areas that has a low to medium population density. Areas/points where higher viewer incidences are expected, are near major transport routes and at popular tourist attractions. Generally, the observers within the ZMVE will be most severely affected. A visual change will occur as a result of the new transmission line and the increased dominance of electrical infrastructure in the study area. The industrial character will contrast with the natural and semi-natural character of the western and central regions, and with the intensely cultivated farmland of the eastern region. It will interfere with pleasant views of the natural landscape in the fore- and middle ground and the highly scenic Outeniqua Mountains in the background. The transmission line will intrude on the observer's visual experience.		
Probability	Definite (5)	Definite (5)
Duration	Long term (4)	Long term (4)
Extent	Regional (3)	Regional (3)
Magnitude	High (8)	Medium (7)
Severity	High (75)	High (70)
Status (Positive/Negative)	Negative	Negative

Reversibility	Medium	Medium
Irreplaceable loss of resources?	Medium	Medium
Can impacts be mitigated: Impacts can be mitigated during the construction phase, but little can be done to mitigate the impacts during the operational phase unless major layout or design changes are made to avoid the potential impacts.		
Mitigation: Refer to Section 8		
Cumulative impacts: Cumulative impacts are highly likely due to the existing Proteus – Droërivier 400kV transmission line in the same route. The new 400kV transmission line will theoretically double the visual prominence of electrical infrastructure through the study area. It is expected to contrast with the natural, semi natural and agricultural characters of the study area, thereby causing visual intrusions along its linear length.		
Residual Risks: Residual risks will occur as the visibility of the power line cannot be effectively reduced, and therefore visual intrusion will remain an impacting factor for the lifetime of the project.		

ALTERNATIVE 1: INLAND RURAL LANDSCAPE TYPE – VISUAL RESOURCE		
	Without mitigation	With mitigation
Construction phase		
Nature of impact: The construction activity will cause a negative effect, primarily on the natural and semi-natural environment of the western and central regions, and the agricultural land use of the eastern region. For the duration of the construction phase, machinery, material and workforce will be uncharacteristic to the visual resource and will contrast with the natural, semi-natural or farming practices. The construction activity is considered incompatible with the prevailing character and will blemish the visual value and scenic quality of the study area.		
Probability	Definite (5)	Definite (5)
Duration	Very short term (1)	Very short term (1)
Extent	Local, but over long linear distance (3)	Contained on site, but over long linear distance (2)
Magnitude	Moderate (6)	Low (4)
Severity	Medium (50)	Medium (35)
Status (Positive/Negative)	Negative	Negative
Operational phase		
Nature of impact: A new transmission line will be a prominent addition to the baseline environment. The complex, industrial character and enormous scale of the towers, will contrast with the natural, semi-natural or farming land uses. Pleasant views of the natural and semi-natural visual resource will be blemished and distant views of the Outeniqua Mountains will be negatively affected. This will cause a reduction in scenic quality of the visual resource.		
Probability	Definite (5)	Definite (5)
Duration	Long term (4)	Long term (4)
Extent	Regional (3)	Regional (3)
Magnitude	High (8)	Medium (6)
Severity	High (75)	High (65)
Status (Positive/Negative)	Negative	Negative
Reversibility	Medium	Medium

Irreplaceable loss of resources?	Medium	Medium
Can impacts be mitigated: Impacts can be mitigated during the construction phase, but little can be done to mitigate the impacts during the operational phase unless major layout or design changes are made to avoid the potential impacts.		
Mitigation: Refer to Section 8		
Cumulative impacts: Cumulative impacts are highly likely due to the existing Proteus – Droërivier 400kV transmission line in the same route. The new 400kV transmission line will theoretically double the visual prominence of electrical infrastructure through the study area. It is expected to contrast with the natural, semi natural and agricultural characters of the study area, thereby causing a reduction in scenic quality of the visual resource.		
Residual Risks: Residual risks will occur, as the impact of the power line on the character of the study area cannot be effectively mitigated over the lifetime of the project.		

ALTERNATIVE 2: INLAND RURAL LANDSCAPE TYPE - OBSERVERS		
	Without mitigation	With mitigation
Construction phase		
Nature of impact: The construction activity will cause a negative effect on observers in the ZMVE during the initial construction activity that will be limited to surface disturbances. As the towers gain height, the visibility and visual exposure will increase progressively. Viewer incidence is generally expected to be medium due to the route passing through rural areas that has a low to medium population density. Areas/points where higher viewer incidences are expected, are near major transport routes and at popular tourist attractions. A visual change will occur and will become progressively more substantial as the project nears completion. It will cause a visual intrusion as a result of disturbances to the natural vegetation and agricultural land uses that relates to tower construction and servitude clearance. The construction activity is considered an uncharacteristic event in the study area that may impact on scenic views.		
Probability	Highly probable (4)	Highly probable (4)
Duration	Very short term (1)	Very short term (1)
Extent	Local, but over long linear distance (3)	Contained on site, but over long linear distance (2)
Magnitude	Low (5)	Low (4)
Severity	Medium (36)	Low (28)
Status (Positive/Negative)	Negative	Negative
Operational phase		
Nature of impact: A new transmission line will be added to the visual environment. It will be highly visible on the level regions, but partially visible in the more mountainous regions. Viewer incidence is generally expected to be medium due to the route passing through rural areas that has a low to medium population density. Areas/points where higher viewer incidences are expected, are near major transport routes and at popular tourist attractions. Generally, the observers within the ZMVE will be most severely affected. A visual change will occur as a result of the new transmission line and the increased dominance of electrical infrastructure in the study area. The industrial character will contrast with the natural and semi-natural character of the western and central regions, and with the intensely cultivated farmland of the eastern region. It will interfere with pleasant views of the natural landscape in the fore- and middle ground and the highly scenic Outeniqua Mountains in the background. The transmission line will intrude on the observer's visual experience.		

Probability	Definite (5)	Definite (5)
Duration	Long term (4)	Long term (4)
Extent	Regional (3)	Regional (3)
Magnitude	High (8)	Medium (7)
Severity	High (75)	High (70)
Status (Positive/Negative)	Negative	Negative
Reversibility	Medium	Medium
Irreplaceable loss of resources?	Medium	Medium
Can impacts be mitigated: Impacts can be mitigated during the construction phase, but little can be done to mitigate the impacts during the operational phase unless major layout or design changes are made to avoid the potential impacts.		
Mitigation: Refer to Section 8		
Cumulative impacts: Cumulative impacts are highly likely due to the existing 2x Proteus – Blanco 132kV distribution lines in the same route. The prominent scale of the new 400kV transmission line will be a large addition to electrical infrastructure in the area. A significant increase (more than double) in visual dominance of electrical infrastructure can be expected which contrasts with the semi-natural and agricultural land uses, thereby causing visual intrusions along the linear length. Three power lines in one corridor are expected to exceed the visual tolerance threshold. The factor that adds weight to this statement is that each line will consist of a different type of tower that causes major visual incoherence and clutter.		
Residual Risks: Residual risks will occur as the visibility of the power line cannot be effectively reduced, and therefore visual intrusion will remain an impacting factor for the lifetime of the project.		

ALTERNATIVE 2: INLAND RURAL LANDSCAPE TYPE – VISUAL RESOURCE		
	Without mitigation	With mitigation
Construction phase		
Nature of impact: The construction activity will cause a negative effect, primarily on the natural and semi-natural environment of the western and central regions, and the agricultural land use of the eastern region. For the duration of the construction phase, machinery, material and workforce will be uncharacteristic to the visual resource and will contrast with the natural, semi-natural or farming practices. The construction activity is considered incompatible with the prevailing character and will blemish the visual value and scenic quality of the study area.		
Probability	Definite (5)	Definite (5)
Duration	Very short term (1)	Very short term (1)
Extent	Local, but over long linear distance (3)	Contained on site, but over long linear distance (2)
Magnitude	Moderate (6)	Low (4)
Severity	Medium (50)	Medium (35)
Status (Positive/Negative)	Negative	Negative
Operational phase		
Nature of impact: A new transmission line will be a prominent addition to the baseline environment. The complex, industrial character and enormous scale of the towers, will contrast with the natural, semi-natural or farming land uses. Pleasant views of the natural and semi-natural		

visual resource will be blemished and distant views of the Outeniqua Mountains will be negatively affected. This will cause a reduction in scenic quality of the visual resource.		
Probability	Definite (5)	Definite (5)
Duration	Long term (4)	Long term (4)
Extent	Regional (3)	Regional (3)
Magnitude	High (8)	Medium (6)
Severity	High (75)	High (65)
Status (Positive/Negative)	Negative	Negative
Reversibility	Medium	Medium
Irreplaceable loss of resources?	Medium	Medium
Can impacts be mitigated: Impacts can be mitigated during the construction phase, but little can be done to mitigate the impacts during the operational phase unless major layout or design changes are made to avoid the potential impacts.		
Mitigation: Refer to Section 8		
Cumulative impacts: Cumulative impacts are highly likely due to the existing 2x Proteus – Blanco 132kV distribution lines in the same route. The prominent scale of the new 400kV transmission line will be a large addition to electrical infrastructure in the area. A significant increase (more than double) in visual dominance of electrical infrastructure can be expected which contrasts with the semi-natural and agricultural land uses, thereby causing a reduction in the scenic quality of the visual resource. Three power lines in one corridor are expected to exceed the visual tolerance threshold. The factor that adds weight to this statement is that each line will consist of a different type of tower that causes major visual incoherence and clutter.		
Residual Risks: Residual risks will occur, as the impact of the power line on the character of the study area cannot be effectively mitigated over the lifetime of the project.		

ALTERNATIVE 3: INLAND RURAL LANDSCAPE TYPE - OBSERVERS		
	Without mitigation	With mitigation
Construction phase		
Nature of impact: The construction activity will cause a negative effect on observers in the ZMVE during the initial construction activity that will be limited to surface disturbances. As the towers gain height, the visibility and visual exposure will increase progressively. Viewer incidence is generally expected to be medium due to the route passing through rural areas that has a low to medium population density. Areas/points where higher viewer incidences are expected, are near major transport routes and at popular tourist attractions. A visual change will occur and will become progressively more substantial as the project nears completion. It will cause a visual intrusion as a result of disturbances to the natural vegetation and agricultural land uses that relates to tower construction and servitude clearance. The construction activity is considered an uncharacteristic event in the study area that may impact on scenic views.		
Probability	Highly probable (4)	Highly probable (4)
Duration	Very short term (1)	Very short term (1)
Extent	Local, but over long linear distance (3)	Contained on site, but over long linear distance (2)
Magnitude	Low (5)	Low (4)
Severity	Medium (36)	Low (28)

Status (Positive/Negative)	Negative	Negative
Operational phase		
Nature of impact: A new transmission line will be added to the visual environment. It will be highly visible on the level regions, but partially visible in the more mountainous regions. Viewer incidence is generally expected to be medium due to the route passing through rural areas that has a low to medium population density. Areas/points where higher viewer incidences are expected, are near major transport routes and at popular tourist attractions. Generally, the observers within the ZMVE will be most severely affected. A visual change will occur as a result of the new transmission line and the increased dominance of electrical infrastructure in the study area. The industrial character will contrast with the natural and semi-natural character of the western and central regions, and with the intensely cultivated farmland of the eastern region. It will interfere with pleasant views of the natural landscape in the fore- and middle ground and the highly scenic Outeniqua Mountains in the background. The transmission line will intrude on the observer's visual experience.		
Probability	Definite (5)	Definite (5)
Duration	Long term (4)	Long term (4)
Extent	Regional (3)	Regional (3)
Magnitude	High (8)	Medium (7)
Severity	High (75)	High (70)
Status (Positive/Negative)	Negative	Negative
Reversibility	Medium	Medium
Irreplaceable loss of resources?	Medium	Medium
Can impacts be mitigated: Impacts can be mitigated during the construction phase, but little can be done to mitigate the impacts during the operational phase unless major layout or design changes are made to avoid the potential impacts.		
Mitigation: Refer to Section 8		
Cumulative impacts: Cumulative impacts are highly likely due to existing electrical lines along the route. An inconspicuous low voltage power line, supported by gum pole structures, are present in the corridor between Gourikwa Substation and the distribution substation in Hartenbos. A monopole distribution line extends further towards the merger point with Alternative 2. From here the existing 2x Proteus – Blanco 132kV distribution lines are in the same corridor to Blanco Substation site. The prominent scale of the new 400kV transmission line will be a large addition to electrical infrastructure in the area. A significant increase (more than double) in visual dominance of electrical infrastructure can be expected which contrasts with the semi-natural and agricultural land uses, thereby causing visual intrusions along the linear length. Three power lines in one corridor are expected to exceed the visual tolerance threshold. The factor that adds weight to this statement is that each line will consist of a different type of tower that causes major visual incoherence and clutter.		
Residual Risks: Residual risks will occur as the visibility of the power line cannot be effectively reduced, and therefore visual intrusion will remain an impacting factor for the lifetime of the project.		

ALTERNATIVE 3: INLAND RURAL LANDSCAPE TYPE – VISUAL RESOURCE		
	Without mitigation	With mitigation
Construction phase		
Nature of impact: The construction activity will cause a negative effect, primarily on the natural and semi-natural environment of the western and central regions, and the agricultural land use of		

<p>the eastern region. For the duration of the construction phase, machinery, material and workforce will be uncharacteristic to the visual resource and will contrast with the natural, semi-natural or farming practices. The construction activity is considered incompatible with the prevailing character and will blemish the visual value and scenic quality of the study area.</p>		
Probability	Definite (5)	Definite (5)
Duration	Very short term (1)	Very short term (1)
Extent	Local, but over long linear distance (3)	Contained on site, but over long linear distance (2)
Magnitude	Moderate (6)	Low (4)
Severity	Medium (50)	Medium (35)
Status (Positive/Negative)	Negative	Negative
Operational phase		
<p>Nature of impact: A new transmission line will be a prominent addition to the baseline environment. The complex, industrial character and enormous scale of the towers, will contrast with the natural, semi-natural or farming land uses. Pleasant views of the natural and semi-natural visual resource will be blemished and distant views of the Outeniqua Mountains will be negatively affected. This will cause a reduction in scenic quality of the visual resource.</p>		
Probability	Definite (5)	Definite (5)
Duration	Long term (4)	Long term (4)
Extent	Regional (3)	Regional (3)
Magnitude	High (8)	Medium (6)
Severity	High (75)	High (65)
Status (Positive/Negative)	Negative	Negative
Reversibility	Medium	Medium
Irreplaceable loss of resources?	Medium	Medium
<p>Can impacts be mitigated: Impacts can be mitigated during the construction phase, but little can be done to mitigate the impacts during the operational phase unless major layout or design changes are made to avoid the potential impacts.</p>		
<p>Mitigation: Refer to Section 8</p>		
<p>Cumulative impacts: Cumulative impacts are highly likely due to existing electrical lines along the route. An inconspicuous low voltage power line, supported by gum pole structures, are present in the corridor between Gourikwa Substation and the distribution substation in Hartenbos. A monopole distribution line extends further towards the merger point with Alternative 2. From here the existing 2x Proteus – Blanco 132kV distribution lines are in the same corridor to Blanco Substation site. The prominent scale of the new 400kV transmission line will be a large addition to electrical infrastructure in the area. A significant increase (more than double) in visual dominance of electrical infrastructure can be expected which contrasts with the semi-natural and agricultural land uses, thereby causing a reduction in scenic quality of the visual resource. Three power lines in one corridor are expected to exceed the visual tolerance threshold. The factor that adds weight to this statement is that each line will consist of a different type of tower that causes major visual incoherence and clutter.</p>		
<p>Residual Risks: Residual risks will occur, as the impact of the power line on the character of the study area cannot be effectively mitigated over the lifetime of the project.</p>		

7.6 VISUAL IMPACT SIGNIFICANCE SUMMARY

Landscape Type	Project Alternative	Sensitivity of receptors	Severity of Impact without mitigation	Severity of Impact with mitigation	Significance of Impact without mitigation	Significance of Impact with mitigation
Coastal towns	Construction phase					
	Alt 3	OB: High	Medium	Low	Moderate	Moderate/Minor
		VR: Medium	Medium	Low	Moderate/Minor	Minor
	Operational phase					
	Alt 3	OB: High	High	High	Major	Major
		VR: Medium	High	High	Moderate	Moderate
Inland rural	Construction phase					
	Alt 1	OB: High	Medium	Low	Moderate	Moderate/Minor
		VR: High	Medium	Medium	Moderate	Moderate
	Alt 2	OB: High	Medium	Low	Moderate	Moderate/Minor
		VR: High	Medium	Medium	Moderate	Moderate
	Alt 3	OB: High	Medium	Low	Moderate	Moderate/Minor
		VR: High	Medium	Medium	Moderate	Moderate
	Operational phase					
	Alt 1	OB: High	High	High	Major	Major
		VR: High	High	High	Major	Major
	Alt 2	OB: High	High	High	Major	Major
		VR: High	High	High	Major	Major
Alt 3	OB: High	High	High	Major	Major	
	VR: High	High	High	Major	Major	

8 MITIGATION

The aim of mitigation is to reduce or alleviate the anticipated impacts that are a consequence of the proposed project's components and/or activities. "Mitigation measures are generally more effective if they are designed as an integral part of an iterative process of project planning and design. Mitigation is thus used as a design approach that is, where possible, implemented from project inception when alternative designs or site options are being considered" (Institute of Environmental Assessment et al, 2002). This approach generates preventative measures that will influence design decisions instead of relying on cosmetic landscape remediation of a completed project.

The following five main mitigation strategies for visual impacts are described by the Institute of Environmental Assessment et al (2002):

- **Avoidance:** Complete avoidance of the impacts is a function of either not proceeding with the proposed project or relocating the project to an alternative site. This is often the most effective mitigation strategies but within the constraints of economics and available land it is not necessarily possible or feasible.
- **Reduction:** Where negative impacts cannot be avoided it should be considered how to reduce the impact as much as possible. Different projects require different solutions but scaling down or limiting disturbances are some of the options.
- **Remediation:** Remediation mitigation relies on add-on or cosmetic measures to "soften" the impact to a degree. This is often associated with screening or camouflage treatment to avoid or limit intrusive views.
- **Compensation:** Where a negative impact cannot be mitigated adequately, other compensatory measures may offset the residual effects. This requires a thorough understanding and assessment of the environment in order to provide equivalent compensation. This may require extensive public consultation, especially if the impacts lean towards sentimental issues or personal values and perceptions.
- **Enhancement:** Enhancement aims to manage certain changes and impacts by enhancing the quality of the environment for local people. This requires the exploring of opportunities in the proposed project to contribute positively to the landscape and its experience. Enhancement may take many forms but could include preservation of ecosystems, proper land management, and restoration of habitats or historic landscapes.

The mitigation measures for the construction and operational phases are discussed within a tabled format in which the following aspects will be addressed.

- The risk sources;
- The potential impacts/risks involved;
- Mitigation objectives; and
- Mitigation measures.

8.1 MITIGATION - CONSTRUCTION PHASE

CONSTRUCTION PHASE	
Risk sources	1.The presence of a construction team in the servitude. 2.Construction camps and stockpiles. 3.Excavations and earthworks.

<p>Potential impacts</p>	<p>1. The presence of a construction team in the servitude.</p> <p>1.1. Increased construction activities in the servitude that could lead to visually intrusive views and a reduction in the visual value.</p> <p>1.2. Introduction of construction equipment and ground staff that is unfamiliar in the baseline environment.</p> <p>2. Construction camps and stockpiles.</p> <p>2.1. Visual intrusion relating to unsightly construction camps and their unorganised nature.</p> <p>2.2. Unsightly stockpiling of construction material and storing of equipment.</p> <p>3. Excavations and earthworks.</p> <p>3.1. Exposed soil and damaged vegetation at each tower/pole location which could lead to unsightly scarring of the landscape and cause a loss in visual value.</p>
<p>Mitigation objectives</p>	<p>1. Avoidance 2. Reduction 3. Remediation</p>
<p>Mitigation measures</p>	<p>1. Avoidance</p> <p>1.1. Do not locate the construction camp or laydown yards within 1 km from any residential area or tourist attraction, unless it can be completely screened from sensitive viewpoints. Preferably, construction camps should be located in a dedicated construction camp near a built up area or in an area that is already disturbed. Two such areas exist; the first is at the Mossdustrya complex, and the second is north west of Hartenbos where a couple of quarries are operated.</p> <p>1.2. Avoid the construction of additional access roads by keeping to existing roads.</p> <p>2. Reduction</p> <p>2.1. Clearly demarcate the construction site to limit the area of disturbance.</p> <p>2.2. Keep dust levels down by regularly wetting dirt roads and exposed soil areas.</p> <p>2.3. Remove rubble and other waste that is generated by the construction process as soon as possible and dispose at an appropriate dump site.</p> <p>2.4. Implement rehabilitation of disturbed areas as soon as possible to limit the duration of exposed soil surfaces. Monitor the rehabilitated areas for at least 6 months to ensure a sufficient vegetation cover is established that will prevent erosion from occurring.</p> <p>2.5. Avoid removal of any large trees or shrubs that may open views to the construction site and compromise the natural screening capacity of the study area.</p> <p>3. Remediation</p>

	<ol style="list-style-type: none"> 3.1. Keep the construction camp neat and tidy at all times. Remove any waste from the site or contain it in an enclosed area out of sight from sensitive viewpoints. 3.2. Enhance screening of the construction camps by erecting a temporary fence with a 3m high shade cloth to limit the intrusive nature of such a site.
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8.2 MITIGATION - OPERATIONAL PHASE

OPERATIONAL PHASE	
Risk sources	1. The presence of a power line through areas of high scenic quality and with highly sensitive viewers.
Potential impacts	<ol style="list-style-type: none"> 1. Visually intrusive views of the power line. 2. Loss of scenic quality. 3. Visual clutter due to the cumulative impact of various electrical infrastructure in close proximity.
Mitigation objectives	<ol style="list-style-type: none"> 1. Avoidance. 2. Reduction. 3. Remediation.
Mitigation measures	<p>1. Avoidance</p> <ol style="list-style-type: none"> 1.1. Maintaining a minimum buffer of 1km around sensitive viewers such as residential areas and tourist attractions, will avoid the transmission line intersecting with the ZMVE and reduce the negative visual intrusion on the specific viewers. This is not always an option and could lead to major route diversions, thus avoidance mitigation can only be considered if the diversion is feasible, implementable and does not impact on other sensitive receptors. 1.2. Avoid landscapes and natural features that are considered highly scenic and contributes to the visual value of the visual resource. This is not always an option and could lead to major route diversions, thus avoidance mitigation can only be considered if the diversion is feasible, implementable and does not impact on other sensitive receptors. <p>2.Reduction</p> <ol style="list-style-type: none"> 2.1. The consolidation of power lines in parallel servitudes is highly recommended and will have the greatest reduction in the severity of the impacts. Cumulative impacts are considered highly likely along all three alternatives and parallel power lines increase the visual dominance of electrical infrastructure to potentially intolerable levels. Consolidating power lines will result in the removal of one of the existing power lines and incorporating it into the new power line, thus reducing cumulative visual impacts. 2.2. Where the proposed power line is sharing a corridor with an existing transmission line, use the same type of towers and uphold the same tower spacing in order to maintain visual coherence.

- 2.3. Keep to the minimum number of directional changes to limit the number of strain towers to be used. Strain towers are considered the most visually intrusive due to their larger visual footprint.
- 2.4. Cross-Rope towers are generally the preferred choice as they are considered the least visible. The Guyed V-towers are used for the existing 400kV transmission line along Alternative 1. To maintain visual coherence, the same type of tower and spacing should be considered.

3. Remediation

- 3.1. Treat the steel members of the transmission towers with a low gloss, galvanized paint to mitigate the initial shiny appearance of a new tower.
- 3.2. Previously rehabilitated areas must be monitored to prevent the infestation of alien vegetation species or unsightly erosion.

9 CONCLUSION AND RECOMMENDATIONS

This VIA assessed the potential visual changes that may occur as a result of the construction and operation of a new 400kV transmission line between the Gourikwa- and Blanco Substations. Three alternative routes have been proposed that extend over a 60 km distance. All three routes traverse areas that are considered highly scenic, as a result of the presence of open water bodies, natural and semi-natural landscapes and the ever present backdrop of the Outeniqua Mountain Range.

In most cases, the transmission line will impact on the aesthetic value of the visual resource by interfering with the prevailing natural and semi-natural character of the study area, or interfering with the agricultural land uses. Areas or features of high aesthetic value and scenic quality has been identified as:

- All the game reserves in the western and central regions that are valued for their natural character, conservation of the indigenous vegetation and scenic landscapes;
- All the large dams and rivers that are crossed by the proposed routes that are valued for its aesthetic value and eco-tourism potential;
- The undulating and varied landscape of the western and central regions that is a cause for picturesque views towards the ocean and towards the Outeniqua Mountain Range.

The study area is predominantly rural with an extended farming community, with the exception of the coastal towns in the southern region and George on the eastern perimeter. Numerous tourist attractions are present in the western and central regions in the form of game reserves, offering luxury accommodation, and other outdoor activity areas such as hiking and horse riding. These tourist facilities rely on the scenic quality of the region and game drives are sometimes offered to experience the picturesque outdoors.

Overall a medium viewer incidence is expected apart from the areas where major transport routes are crossed or near the coastal towns. Highly sensitive viewers and viewer groups occur all along the proposed routes. Concentrations of highly sensitive viewers and major tourist attractions have been identified at:

- Gondwana-, Hartenbos- and Botlierskop Game Reserve;

- Hartebeeskuil-, Klipheuwel- and Wolwedans Dams;
- Western outskirts of Hartenbos, Monte Christo Estate and Wolwedans; and
- All the tourist attractions and overnight facilities that are within the ZMVE;

Reduction and remediation mitigation will not be effective to prevent residual impacts from occurring. The proposed transmission line will remain visible unless major design or alignment changes are implemented. The option of consolidating existing lines into the design of the new transmission line is regarded as very effective and is highly recommended to prevent major cumulative impacts. Although cumulative impacts may still occur, the significance thereof will be reduced and the exceedance of a visual intolerance threshold may be avoided.

Avoiding sensitive landscape features and observers is regarded as being the most effective mitigation measure in reducing direct, cumulative and residual impacts. This is, however, a complex measure to implement, and is reliant on technical/feasibility studies as well as a much larger study area assessment to ensure that other sensitive features and observers are not impacted. Due to these unknown factors, avoidance mitigation is only proposed within the 2 km corridor that will reduce visual impacts on certain receptors.

Preferred route

Although all three routes have high impacts on both observers and the visual resource, Alternative 1 is the most preferred route. The motivation is that the baseline environment is already impacted by the Proteus – Droërvier 400kV transmission line which lowers the sensitivity of the visual environment to some degree. One can argue that the project is more compatible with the baseline environment along Alternative 1, than the other two alternative routes. It is generally more acceptable to have two power lines of the same design, in one corridor, thereby concentrating the impact in that corridor, than to spread the impact over a larger area, thereby impacting on other landscapes that are free of transmission lines. Empirical research has indicated that two parallel running power lines are considered below the visual tolerance threshold in most cases, but three or more power lines nears, or exceeds, the threshold, increasing cumulative impacts to unacceptable levels. This is especially relevant in landscapes with high scenic value or high tourist potential as is found in parts of the study area.

In addition, Alternative 1 is the route that impacts on the least number of sensitive landscape features and steers clear of the least number of tourist attractions. Without drastic mitigation measures, the impact on the visual resource and sensitive observers will remain high.

Alternative 2 is more preferred than Alternative 3. Alternative 3 passes within 1 km of an urban area and the increased viewer incidence makes it less preferable than Alternative 2. Both these alternatives will have significant cumulative impacts due to the existing 2x132kV distribution lines in the same corridor. A significant increase in visual dominance of electrical infrastructure can be expected. Three power lines in one corridor are expected to exceed the visual tolerance threshold. The factor that adds weight to this statement is that each line will consist of a different type of tower that causes major visual incoherence and clutter.

The No-Go alternative will have no change to the visual environment and will therefore not cause any impacts.

Conclusion

This assessment highlights that highly significant impacts are expected in the study area and require major interventions to reduce the direct and cumulative impacts in particular. Authorisation of this project will result in significant losses in aesthetic value that will cause high levels of visual intrusion in some areas. The impact is only reversible with human intervention and stand a moderate risk of causing an irreplaceable loss in resources.

10 REFERENCES

As a matter of best practice, this assessment is based on internationally accepted guidelines and standards with regards to VIA. The following sources are frequently referred to:

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APPENDIX 1

The Zone of Visual Influence (ZVI) can be determined through a method referred to as visibility/viewshed mapping. This provides the visual specialist with a first order impression of the extent of a project's visibility and aids in the identification of sensitive observers that may be affected. Computer-based software generates a three-dimensional model of the landscape in which the visibility of an object is tested. The result is a map with coloured regions in which the potential for a direct visual connection exists. These coloured regions are the ZVI and are limited to a distance of 5 km beyond which the sources of visual impact are considered negligible and thus omissible. Figure 16 & Figure 17 are visibility maps of the two proposed alternatives at a height of 40m.

CONCLUSION

The prevailing vegetation cover in the study area plays a limited to insignificant role in screening the transmission line. Most of the screening comes from topographical features as illustrated in the areas where the power lines cross through mountainous regions. The exposed landscapes such as the eastern region, coastal plain are near Gourikwa Substation, and plateau areas, provides limited screening.

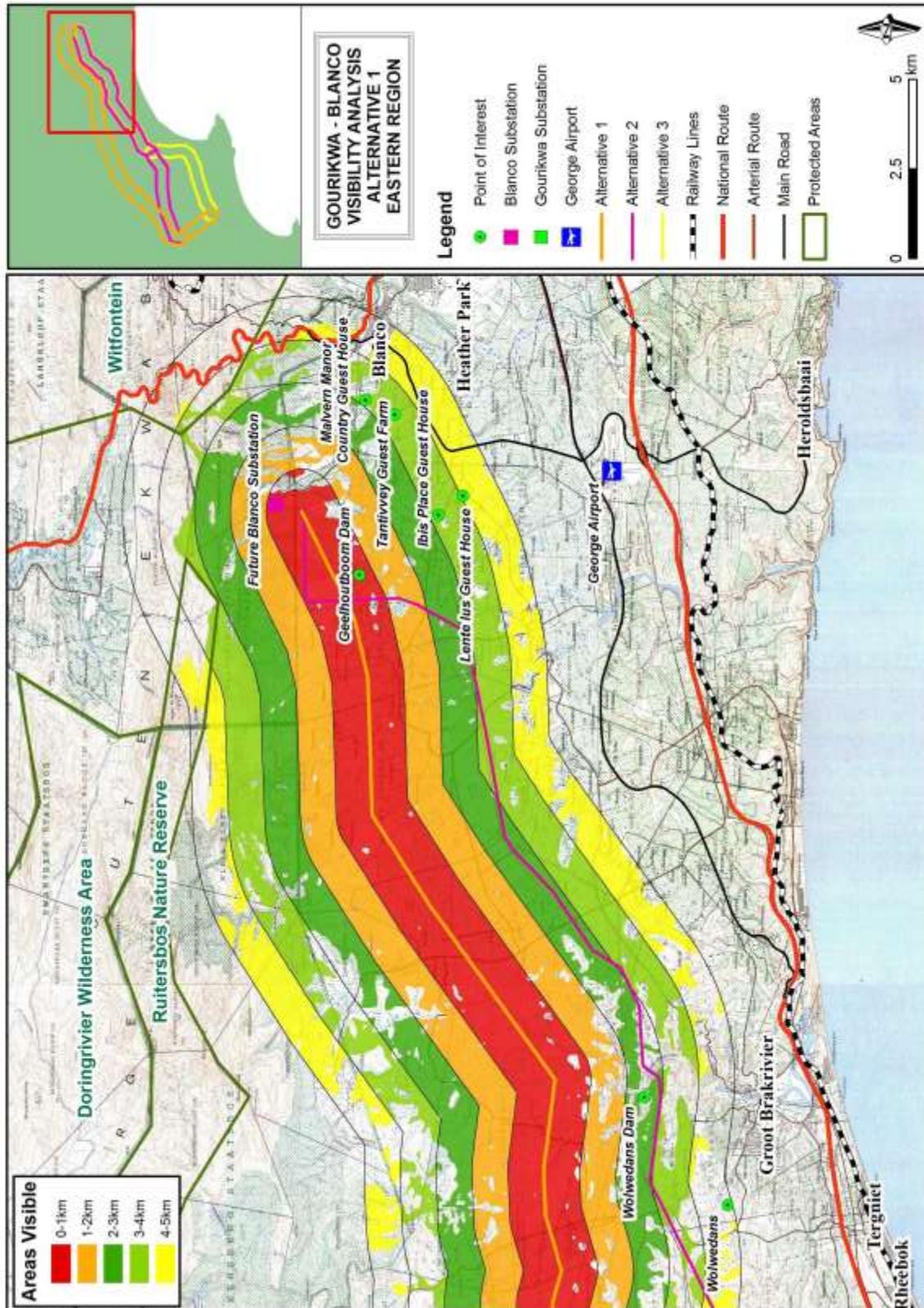


Figure 16: Visibility analysis – Alternative 1 (Eastern region)

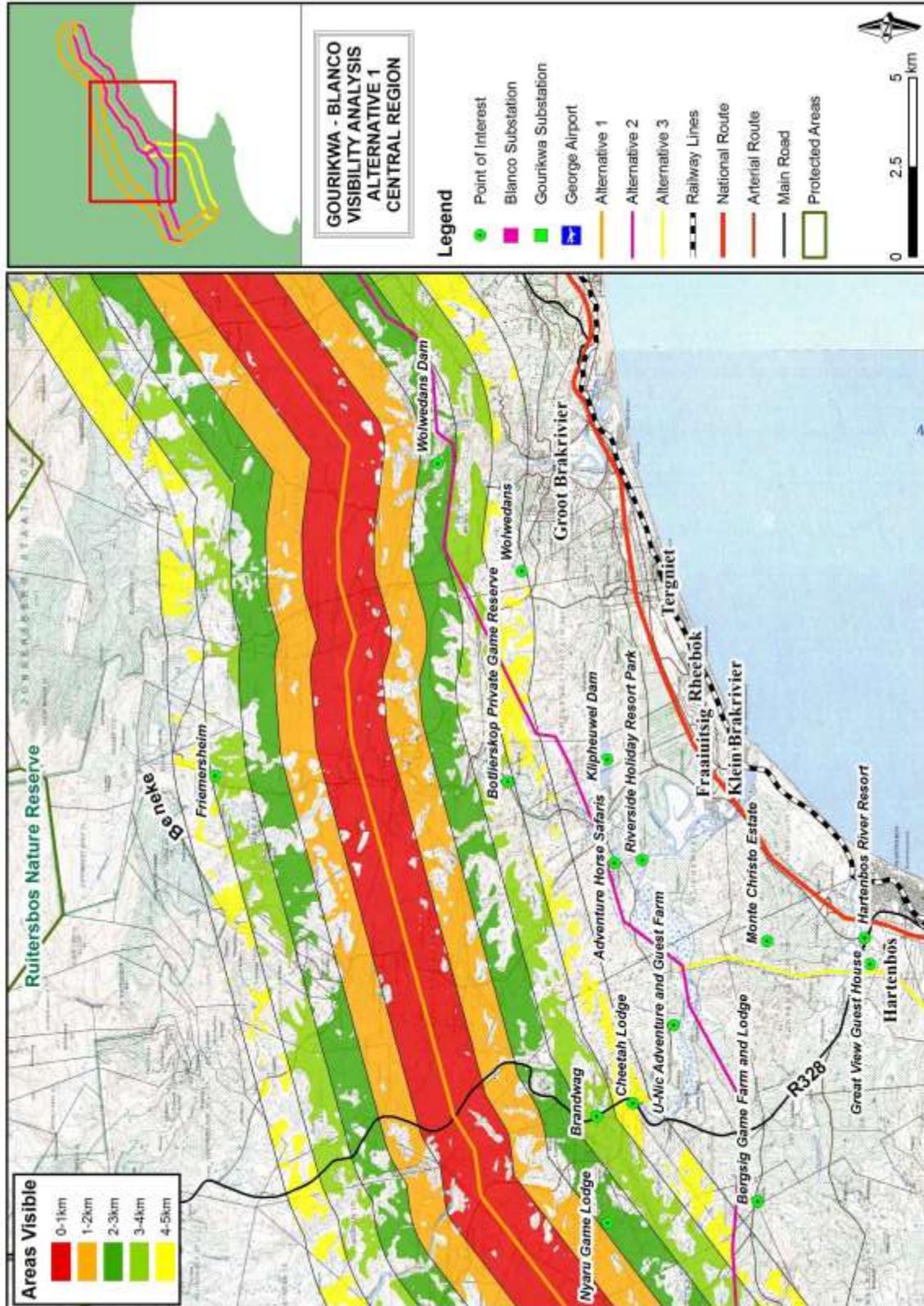


Figure 17: Visibility analysis – Alternative 1 (Central region)

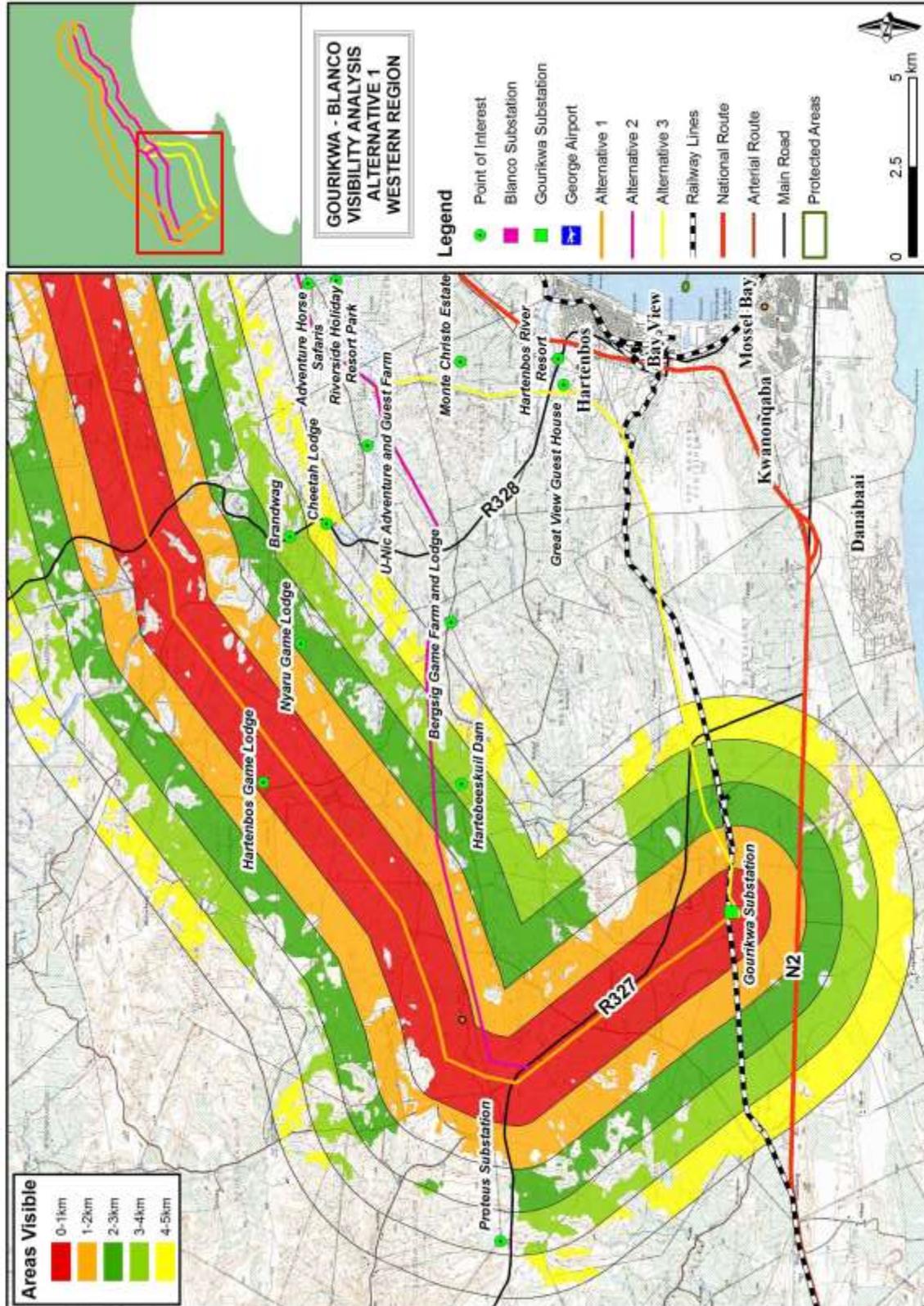


Figure 18: Visibility analysis – Alternative 1 (Western region)

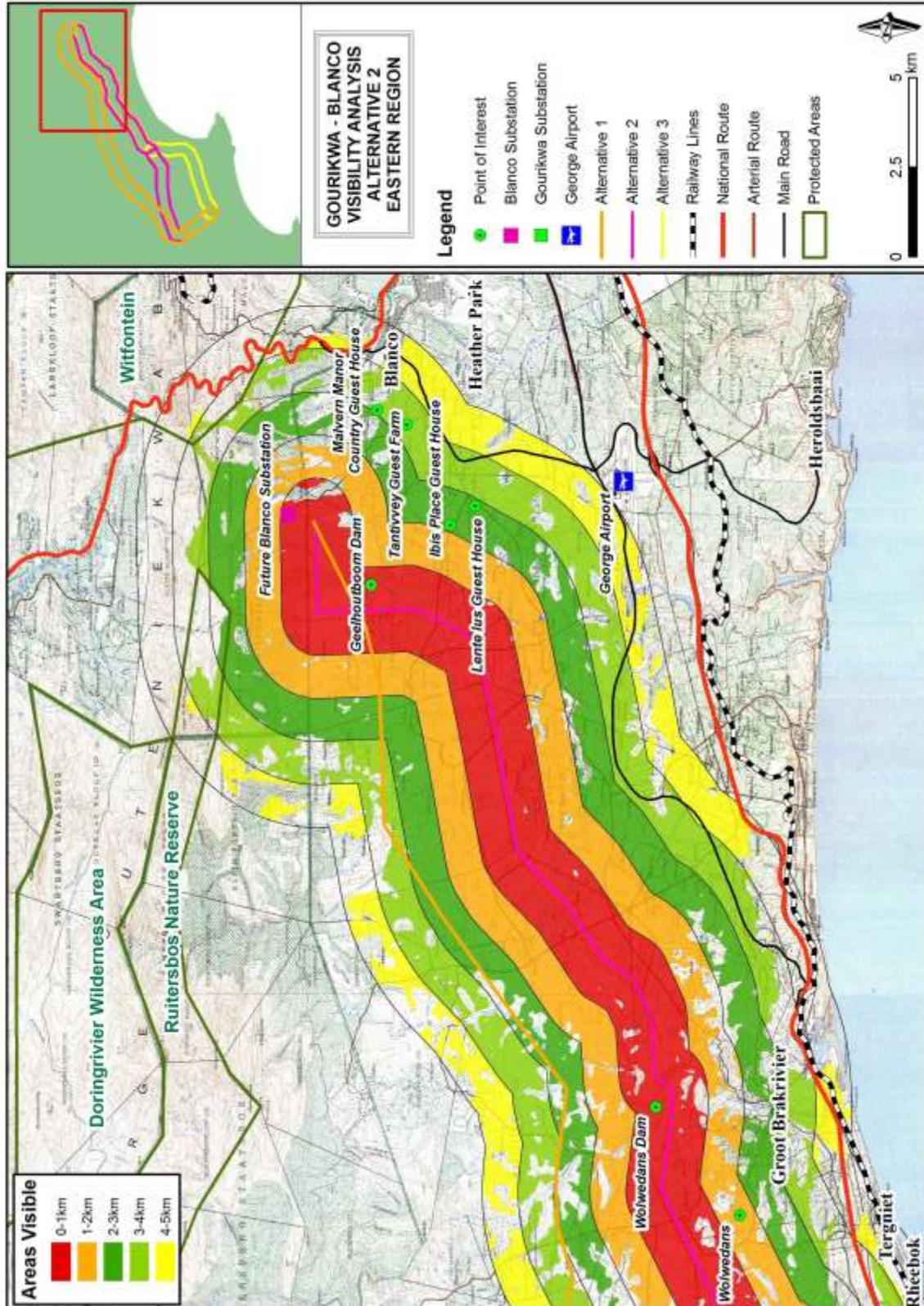


Figure 19: Visibility analysis – Alternative 2 (Eastern region)

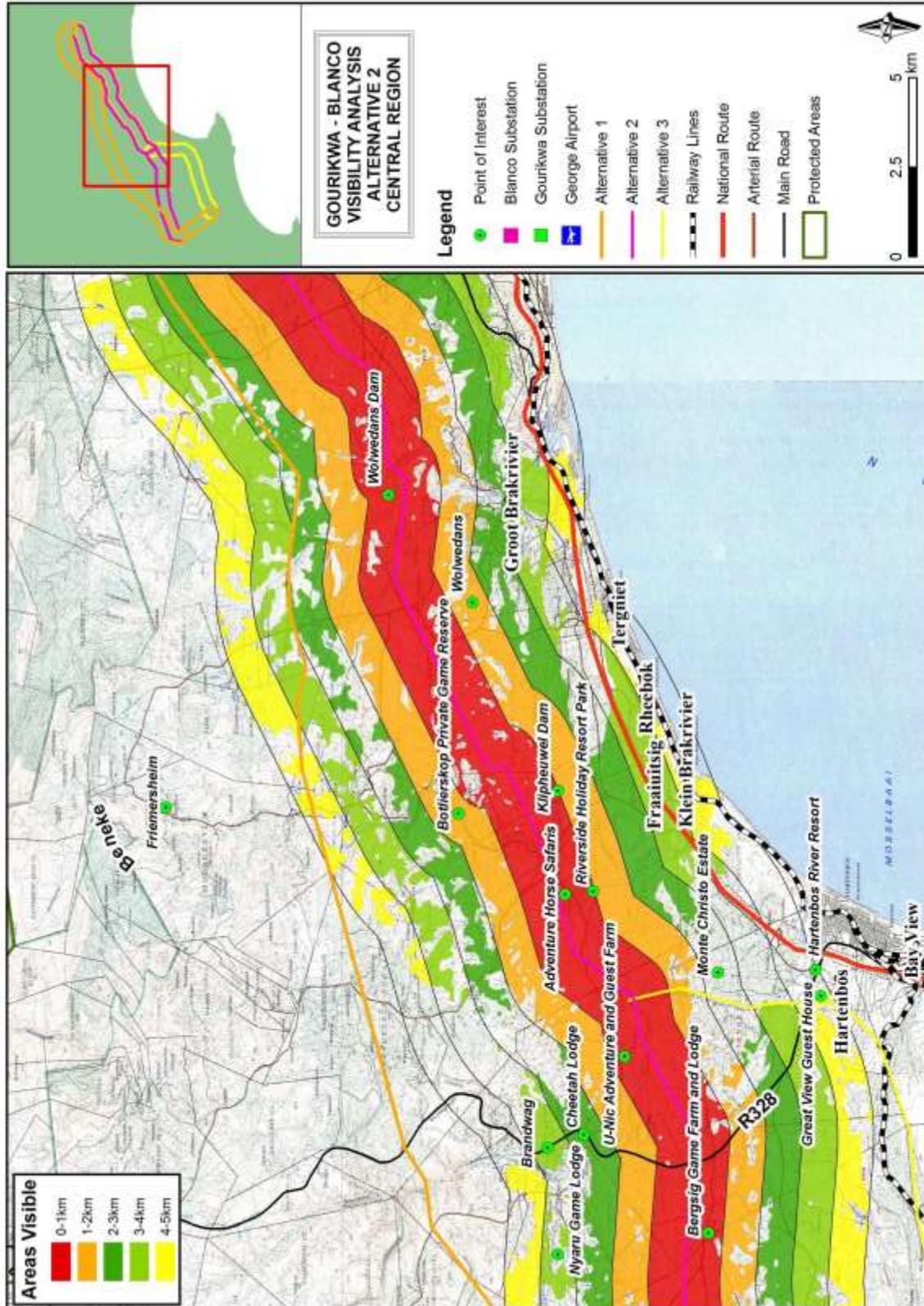


Figure 20: Visibility analysis – Alternative 2 (Central region)

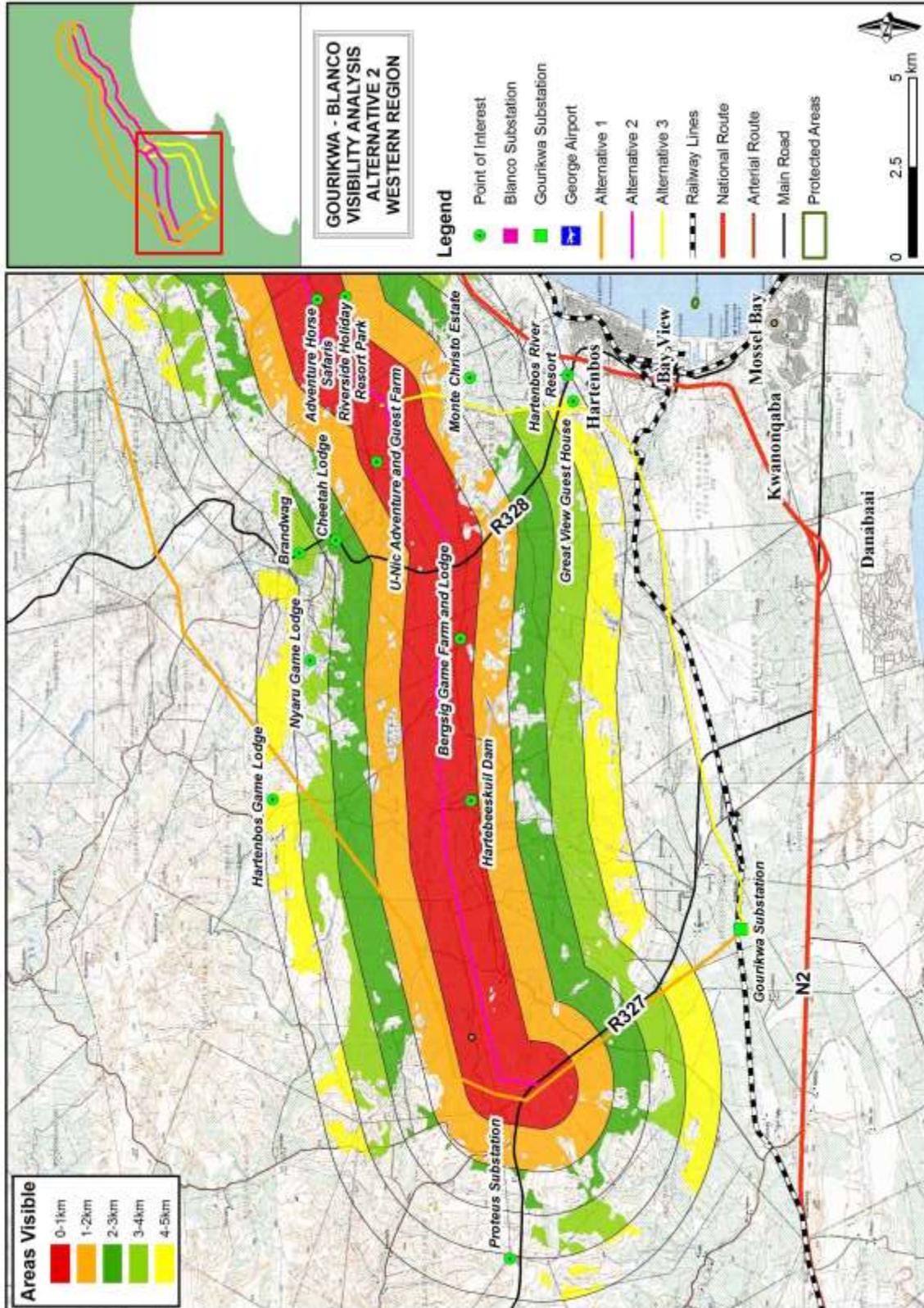


Figure 21: Visibility analysis – Alternative 2 (Western region)

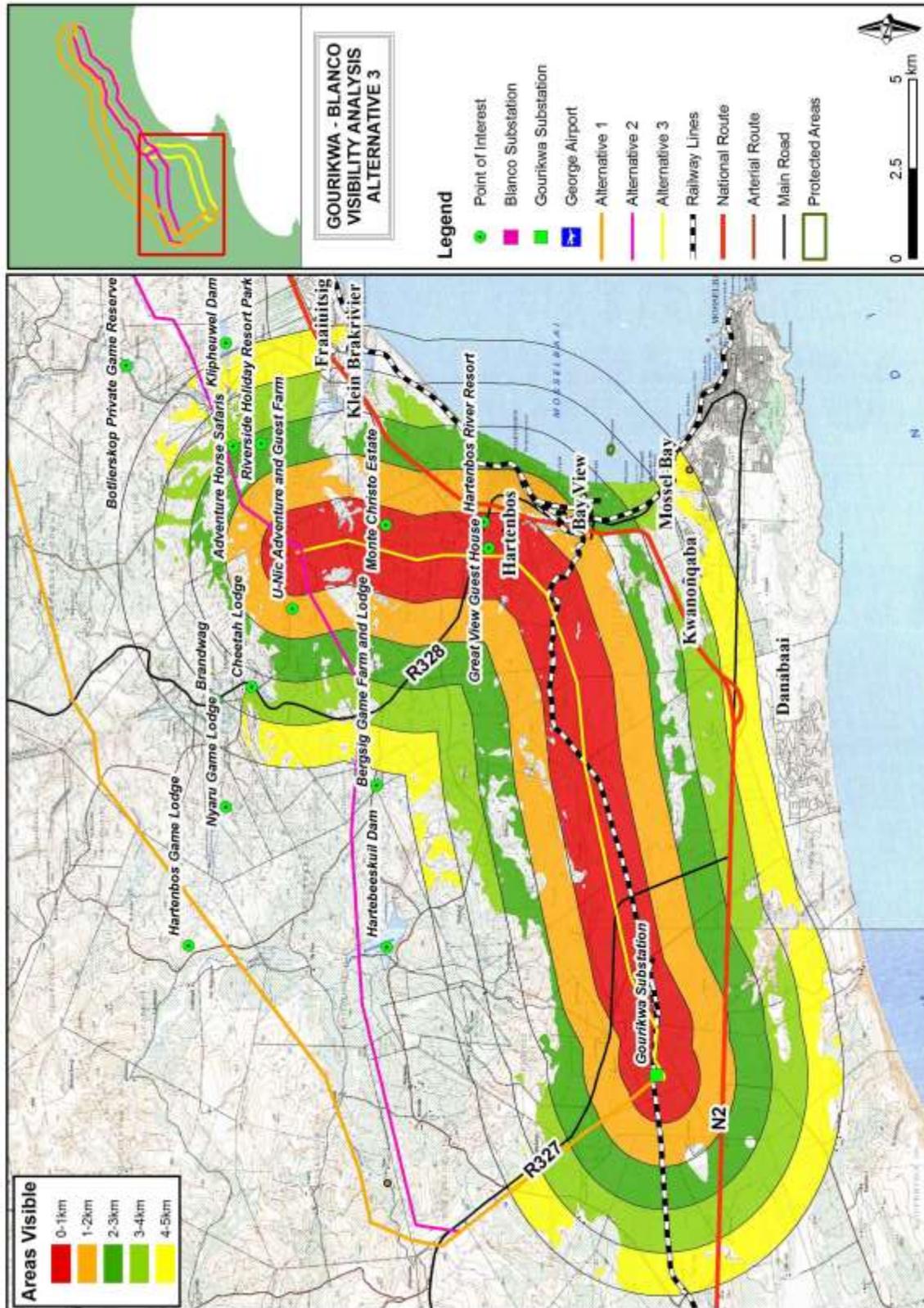


Figure 22: Visibility analysis – Alternative 3 (Diversion of Alternative 2)

APPENDIX 2

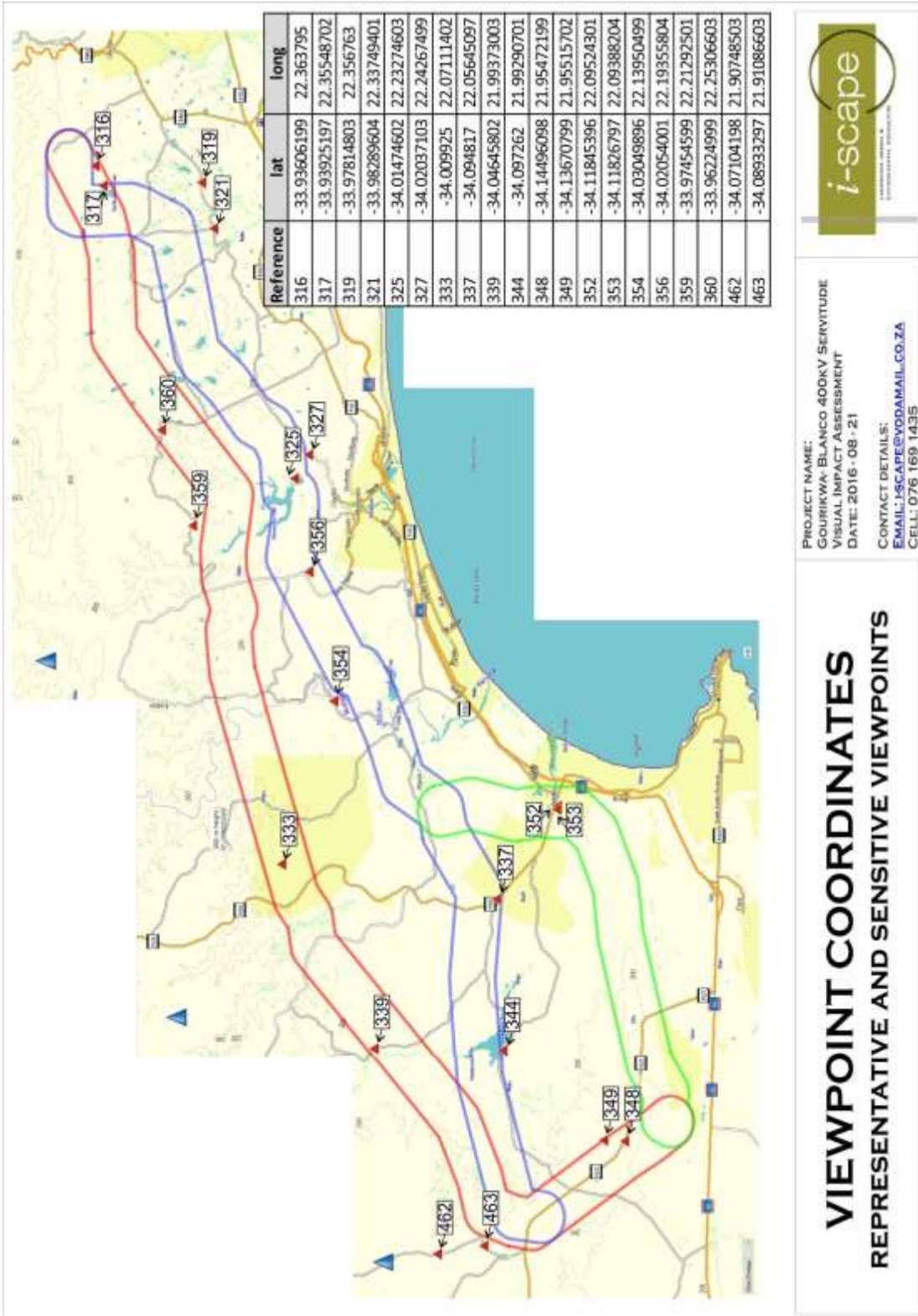


Figure 23: Sensitive Viewpoint locations

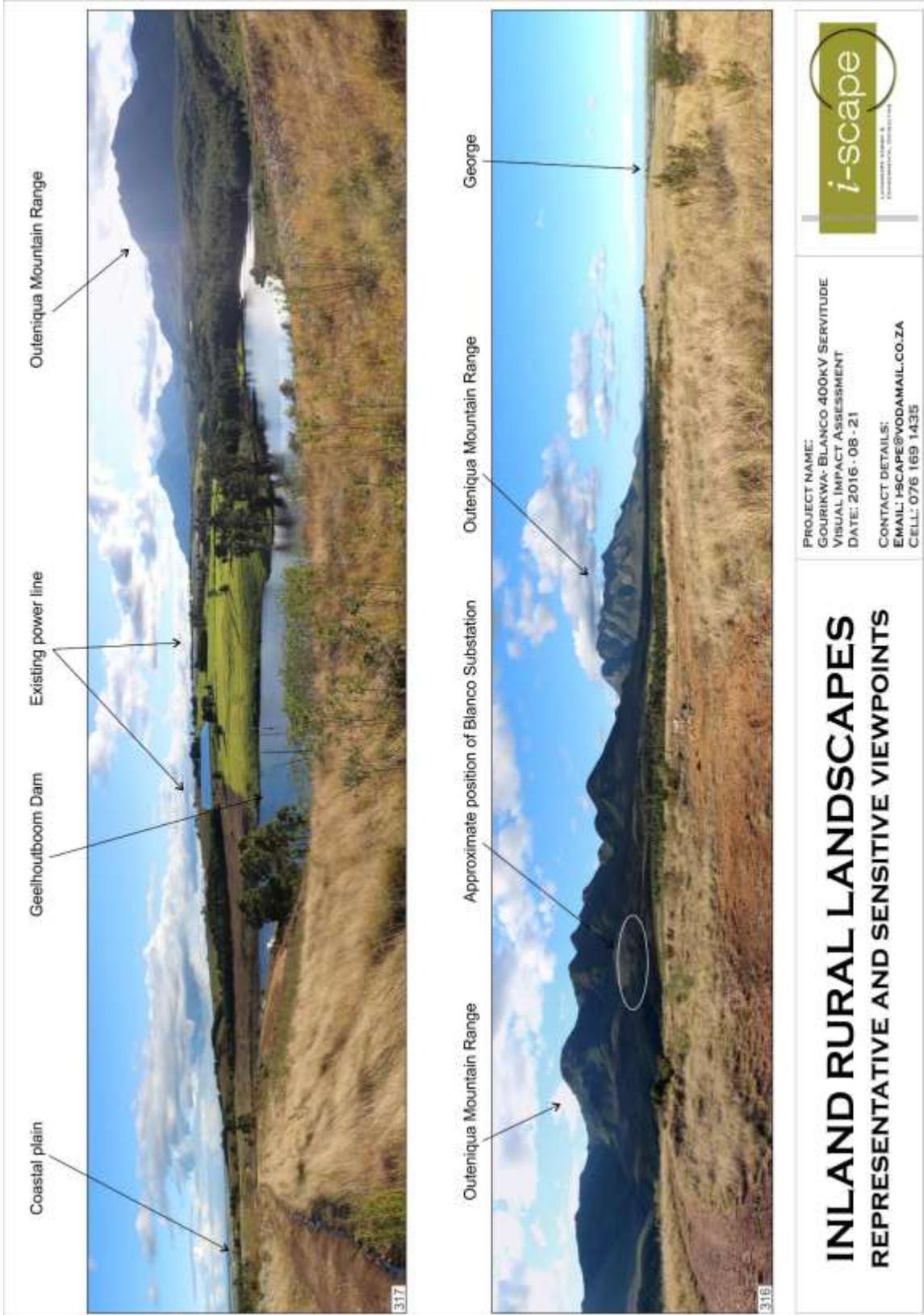


Figure 24: Rural Inland Landscape (1)



Figure 25: Rural Inland Landscape (2)

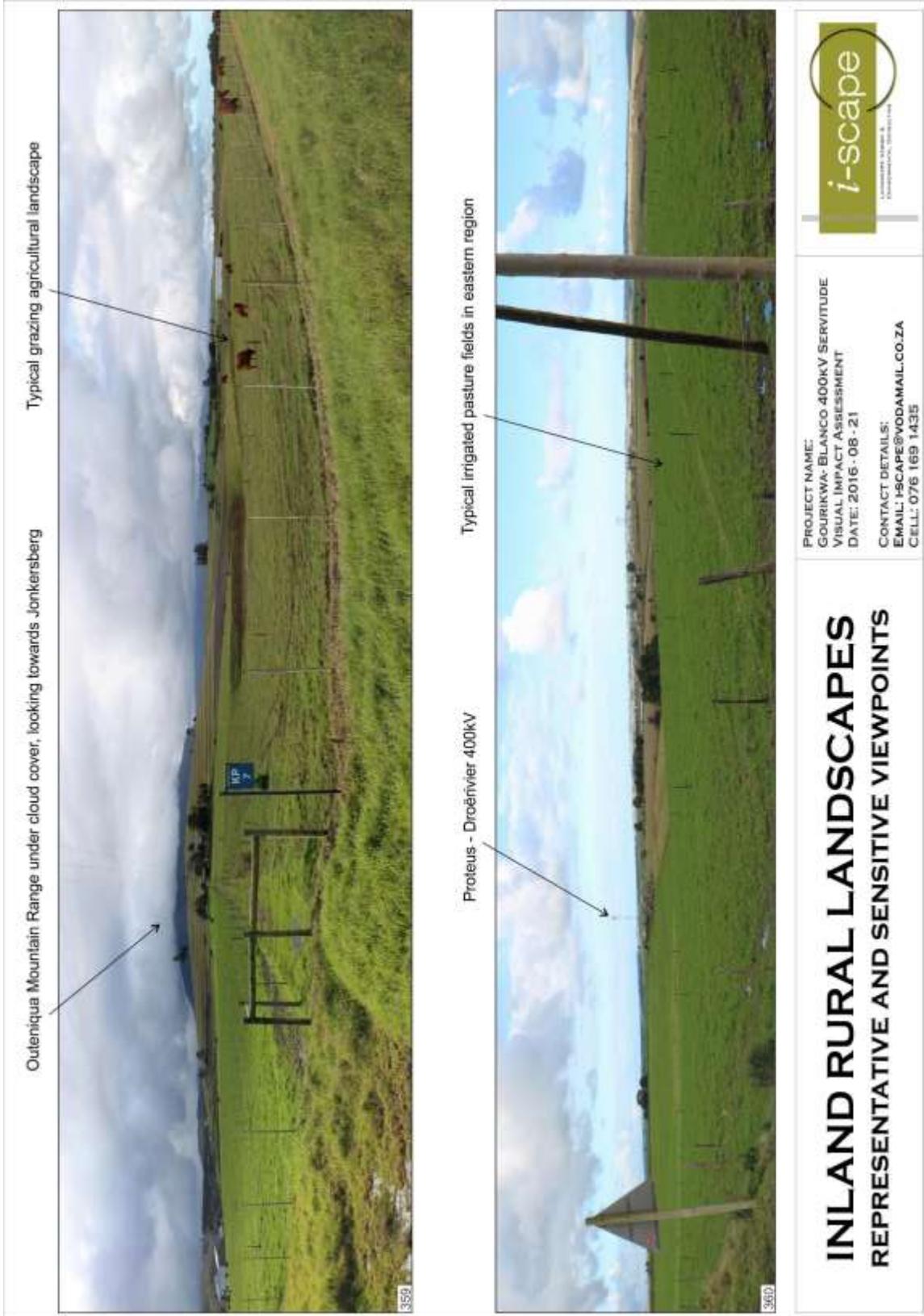


Figure 26: Rural Inland Landscape (3)

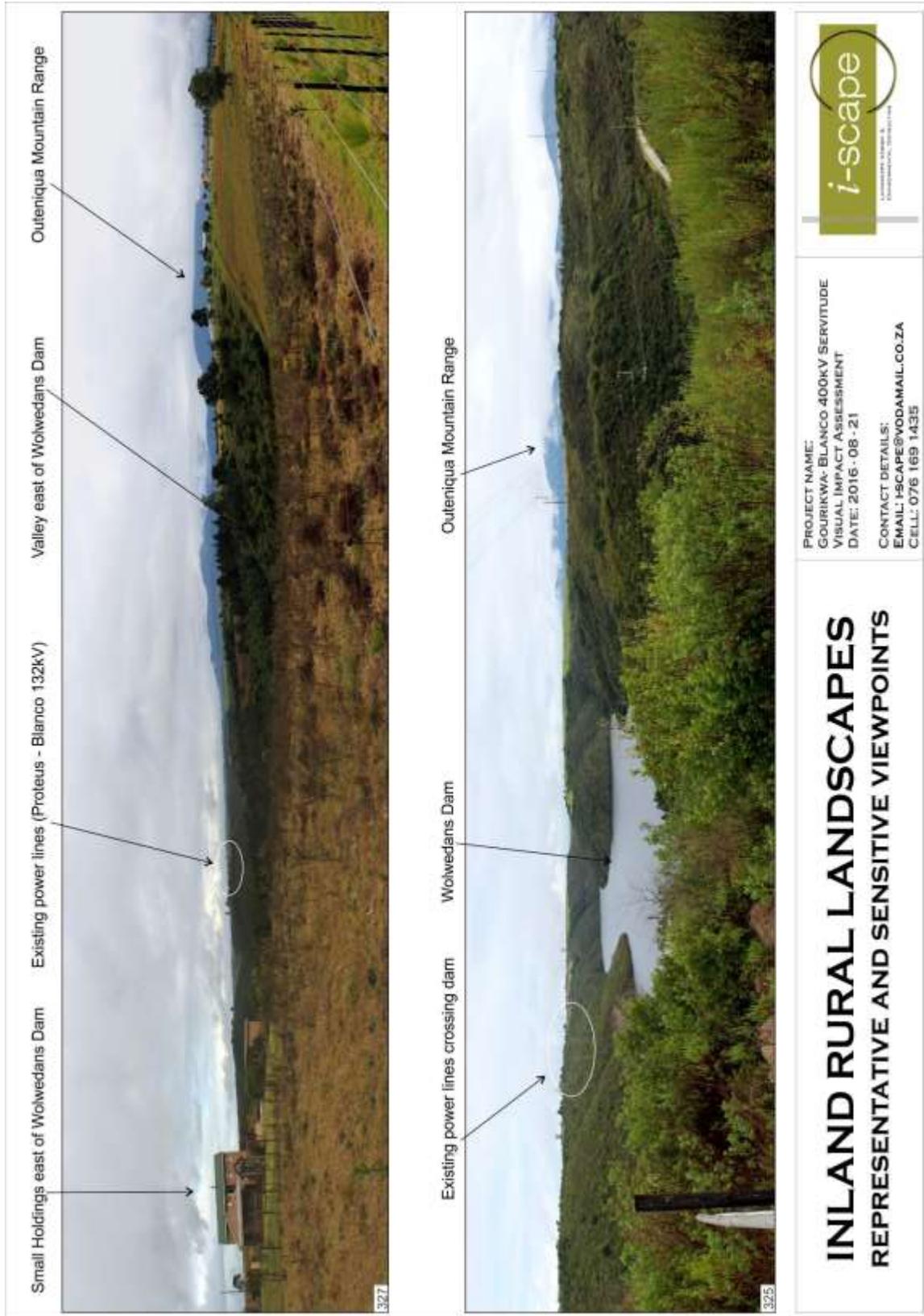


Figure 27: Rural Inland Landscape (4)



Figure 28: Rural Inland Landscape (5)



Figure 29: Rural Inland Landscape (6)

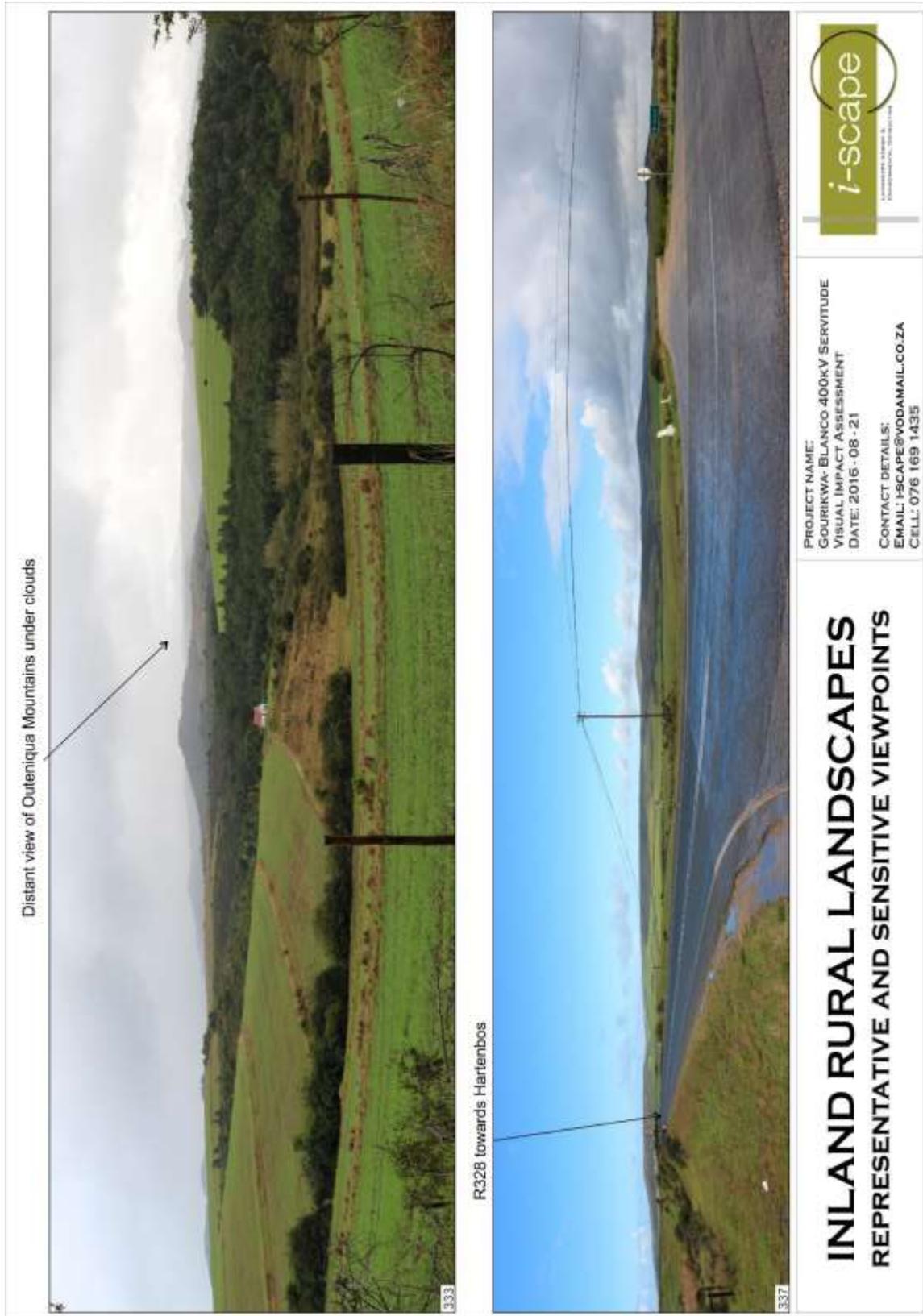


Figure 30: Rural Inland Landscape (7)

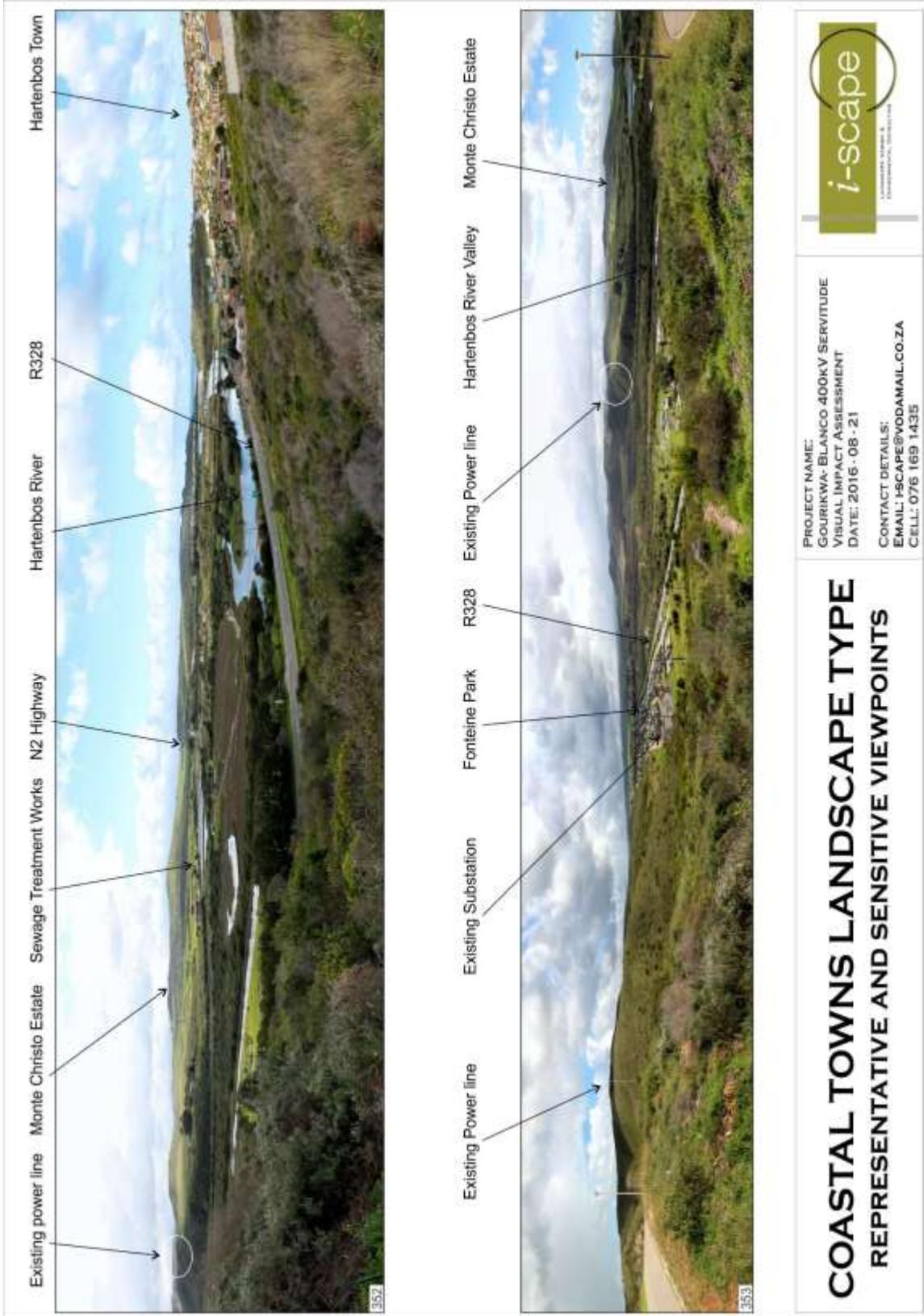


Figure 31: Coastal Towns



Figure 32: Rural Inland Landscape (8)



Figure 33: Rural Inland Landscape (9)

APPENDIX 3

IMPACT SEVERITY ASSESSMENT CRITERIA

The assessment of the significance of a visual or landscape impact is a combination of how severe an impact is considered to be, and how sensitive are the receptors that are being impacted on. According to Section 13 of the 2014 EIA Regulations 982, the following assessment criteria is followed to describe the severity of the impact along the topics of nature of impact, extent, duration, magnitude and probability.

Nature of impact:

A description of what causes the effect, what will be affected and how it will be affected. A distinction is made between direct, indirect, cumulative and residual impacts.

Extent:

1. Contained on site.
2. Local area, limited to the project site and adjacent properties.
3. Regional, often affecting a large community such as a town or municipal area.
4. Larger region, affecting an area that is on a provincial or national scale.
5. Crossing international borders.

Duration:

1. Very short duration, <1 years.
2. Short duration, 2-5 years.
3. Medium term, 5-15 years.
4. Long term, >15 years.
5. Permanent.

Magnitude:

0. Small and will have no effect on the environment.
2. Minor, although detectable, it will not result in an impact on processes.
4. Low and will cause a slight impact on processes.
6. Moderate and will result in processes continuing but in a modified way.
8. High, processes are altered to the extent that they temporarily cease.
10. Very high and result in complete destruction of patterns and permanent cessation of processes.

Probability:

1. Very improbable, will probably not happen.
2. Improbable, some possibility but low likelihood.
3. Probable, distinct possibility.
4. Highly probable, most likely.
5. Definite, impact will occur regardless of any prevention measure.

Additional to the aforementioned criteria, there is also mention of the **Reversibility** of an impact and the risk of **Irreplaceable loss of resources**:

Reversibility:

1. Low – Irreversible.
2. Medium – Reversible but with human intervention.
3. High – Completely reversible.

Irreplaceable loss of resources:

1. High – No potential for replacing a particular vulnerable resource that will be impacted.
2. Medium – Resource can be replaced with human intervention.
3. Low – No irreplaceable resource will be impacted.

The significance of the impact is determined by plotting the severity of the impact and the sensitivity of the receptors on a matrix.

		Impact severity				
		Very high	High	Medium	Low	Very low
Receptor sensitivity	Very high	Substantial	Major	Major/Moderate	Moderate	Moderate/Minor
	High	Major	Major	Moderate	Moderate/Minor	Minor
	Medium	Major/Moderate	Moderate	Moderate/Minor	Minor	Minor/Negligible
	Low	Moderate	Moderate/Minor	Minor	Minor/Negligible	Negligible
	Very low	Moderate/Minor	Minor	Minor/Negligible	Negligible	Negligible/None

APPENDIX 4

GLOSSARY OF TERMS

(Derived from the IEMA & LI Guidelines with additional descriptions)

Baseline: Record and analysis of existing landscape and visual conditions. A description of the status quo.

Cumulative effects/impacts: The summation of effects that result from changes caused by a development in the conjunction with other past, present and reasonably foreseeable actions.

Landscape: The European Landscape Convention (2000) defines landscape as “an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors.” It can also include rural landscapes, townscapes and seascapes.

No-Go or Do-Nothing alternative: Continued change/evolution of the landscape or of the environment in the absence of the proposed development.

Impact severity: A combination of the probability, duration, extent and magnitude of an impact. It is calculated with an equation of $S=(E+D+M)P$ where E,D,M and P are given values in the impact report and impact severity is determined to be low, medium or high.

Impact significance: A combination of the impact severity and the receptor sensitivity based on values of high to insignificant.

Indirect impacts: Impacts on the environment, which are not a direct result of the development, but are often produced away from it, or as a result of, a complex pathway. Sometimes referred to as secondary impacts.

Land use: The primary use of the landscape or dominant functions.

Land cover: Refers to the elements that are on the surface of the landscape. Relates to the land use.

Landform: Combinations of slope and elevation that produce the shape and form of the land surface.

Landscape Character Assessment: A Landscape Character Assessment (LCA) identifies and describes the comprising attributes and their qualities/values in the study area. It recognises that a landscape consists of interconnected systems, patterns and individual components that is defined by the natural, cultural and historical aspects of the region.

Landscape exposure: Landscape exposure refers to the openness of a landscape and the ability or inability to experience panoramic views across vast distances. It relates to the VAC of a landscape.

Landscape type: A landscape type (LT) will have broadly similar patterns of geology, landform, vegetation, land uses, settlement patterns, etc. that gives it a common character.

Landscape feature: A prominent eye-catching element that is unique to a specific landscape.

Landscape sensitivity: The extent to which a landscape can accept change of a particular type and scale without unacceptable adverse effects.

Mitigation: Measures, including any process, activity or design implementation to avoid, reduce, remedy or compensate for the adverse effect of an impact or visual effect due to a development.

Receptor (Landscape or viewer): A physical landscape feature, resource, character component or viewer group that will experience an effect from a development.

Residual risks: The risk that will remain after all the recommended measures have been undertaken to mitigate the impact associated with the activity (Green Leaves III, 2014)

Study area: An area determined by the specialist to be the area of impact. This area may vary from project to project and is usually the extent of visibility.

Viewshed: A viewshed analysis or visibility mapping is a GIS generated area that calculates the direct line of sight of an object in a study area based on the topography in the study area. This provides a first order impression of the visibility of an object without the screening effect of vegetation or other structures.

Visual Absorption Capacity (VAC): VAC is the degree of ability of a study area/landscape to conceal or absorb the proposed project.

Visual Exposure: Visual exposure has reference to a specific observer or observer group, and relates to how close a viewer is to an impact, or what percentage of the impact is visible, and how it affects the viewers' visual field.

Visual Resource: Any scene of a landscape can be referred to as a visual resource. The term, visual resource, is commonly used when the value of the scene is described.

Visual tolerance/intolerance threshold: A visual tolerance/intolerance threshold is a point where a specific cumulative impact oversteps the boundary between being accepted or not accepted. It is a very subjective matter and it is up to the visual specialist to motivate why the threshold is reached or exceeded.

Zone of Visual Influence (ZVI): Area from which a proposed development is likely to be visible, based on GIS viewsheds and field observations.